ENVIRONMENTAL ASSESSMENT

FOR REHABILITATION OF THE PARK ROAD IN THE SANCTUARY SADDLE AND 4.5 MILE AREAS OF DENALI NATIONAL PARK

Prepared by
United States Department of the Interior
National Park Service
Denali National Park and Preserve

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I. PURPOSE AND NEED

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA), is considering a two-section road rehabilitation project on the Denali Park Road (park road) in Denali National Park and in Preserve (the park). For the MP 24.3 – 25.0 (Sanctuary Saddle) section, the NPS is proposing to address drainage and subgrade issues, address backslope movement, add a gravel surface wear layer, and replace culverts along a 2350 foot long section of park road. The slope above the road slides towards the road and fills the ditch line, erodes, and endangers the road with saturated mud. In the MP 4.5 area, backslope stabilization work is proposed to complete a project begun in 2008 (*Park Road Mile 4 and 4.5 Repair*, PEPC #17817, FONSI approve 8/24/07).

The project is necessary because the Sanctuary Saddle section of road has long been identified as having drainage problems and a mobile backslope (see cover). Objectives of the project would be to remove water from the road subbase and reduce saturation of the road prism, keep the slumping backslope from filling and blocking the ditch, reshape the road so that the dimensions do not exceed the maximum width standard (28 feet), replace overage culverts, and add a new driving surface wear layer of gravel. The work at MP 4.5 is necessary because some segments of the backslope that were not treated during the 2007-2008 project have slumped and are starting to fill the constructed ditch that is supposed to retain ice during the winter.

This Environmental Assessment (EA) analyzes a No Action Alternative and two action alternatives for rehabilitation of two sections of the Denali Park Road within Denali National Park and Preserve and has been prepared according to the National Environmental Policy Act of 1969 and regulations of the Council of Environmental Quality (40 CFR 1508.9).

Background

A single, 92-mile road serves Denali National Park and Preserve. The park road provides controlled vehicle access into the park for visitors, park administration, and inholders. The road begins at the junction with the George Parks Highway (Alaska Highway #3) and ends at the Kantishna airstrip (Figure 1).

The park road has an asphalt surface from Mile 0.0 at the George Parks Highway to the Savage River Bridge at Mile 14.9, where controlled access begins beyond the check station. The remainder of the road has a gravel surface. The road prism and surface conditions vary considerably from the Savage River Bridge to the Kantishna Airstrip at Mile 92. The park road was built by the Alaska Road Commission and construction was funded by annual Congressional appropriations as road construction of the park road proceeded west from 1923 to 1938. The MP 4.5 section was started in 1923. The Sanctuary Saddle section was probably constructed in 1927.

Prior to the opening of the Denali Highway in 1957, there were very few private vehicles anywhere on the park road, and all traffic decreased the farther west one went on the road. Because most of the visitor and vehicular activity originates at the east end of the road – near the Alaska Railroad and the George Parks Highway – plans to improve the road have typically been based on a telescoping approach. Basically, the road gets more primitive the farther west one

travels. The Mission 66 proposal of 1956-1966 to pave the road to MP 31 and to make it a uniform width (and "oiled") from there to the Eielson Visitor Center (Eielson) at MP 66 was halted due to a national outcry over excessive improvements to a wilderness road.

The Sanctuary Saddle section of the road was widened and improved during the Mission 66 period, in preparation for paving. By a later plan in 1982 to improve the condition of the road, the road in the Sanctuary Saddle section got a new lift of a 4 - 6 inch wear layer of gravel. No subexcavation took place. Routine grading since 1972, which can include pulling loose material out of the ditch and spreading it across the road, has likely widened the road structure by widening the uphill ditch and widening the downhill fill slope with uncompacted spill material. The hillside above this section of road appears to be underlain by unstable permafrost. Some sliding of material into the uphill road ditch routinely occurs during the summer and the material needs to be overboarded by the park road grader to the downhill side of the road or transported away (if it is dry enough) to help reclaim disturbed areas at the MP 28 Teklanika Pit. Some culverts have been recently replaced and some drainage windows exist to help carry water away from the road prism across from culverts.

The MP 4.5 section of road was paved in 1966 and again in 1990. A project to control aufeis (aufeis is a German word meaning "ice on top" that is used to describe the formation of thick sheets of ice at locations of groundwater seepage in arctic climates) in 2008 involved installing 1,044 linear feet of a 12 inch thick rock blanket to cover the exposed backslope above the road. The backslope for the full length of the 2,300 foot-long project had the vegetation and soils removed to create a large area to store winter ice. The road ditch was widened and deepened and numerous 8 foot diameter culverts were installed. Much of the backslope seepage now runs through the culverts, but eventually through the winter fills the ditch and culverts with ice. The thickness of aufeis on the park road has dropped from previous levels that reached the shape of a long ten foot high dome to about one foot of ice on the road. This makes ice removal in the spring quicker and much less hazardous. A couple of backslope areas that did not receive backslope treatments in 2008 have since slumped and require action as they continue to fill the ditch (see inside cover). Six inches of topsoil to facilitate native revegetation and to cover the engineered aspect to the rock blanket has not yet been placed, though it was identified as part of the project in 2008.

To quantify the quality elements of the park road character as described in the 2007 *Entrance Area and Road Corridor Development Concept Plan/Environmental Impact Statement*, a Road Design Standards (RDS) document (NPS 2007) was finalized in 2007. The document addresses the size, shape and strength of - and the footprint covered by - the road structure, as well as sight distance issues, drainage issues, roadside brushing, and the use of geotechnical products. As stated in the RDS, the continued preservation of the character of the Denali Park Road and the visitor experience it provides rests on many factors, including providing a structurally sound road, a limit to the size and weight of the design vehicle, a limit to the number of vehicles using the road, education so that drivers follow the Rules of the Road, and prescribing minimum and maximum widths.

Recent park road rehabilitation projects that improved drainage, pullouts, surface wear material, and subbase included Igloo Canyon (2007, Milepost (MP) 80-84 (2010-2011), and Porcupine (2012). A short re-route at MP 4 and backslope work at MP 4.5 formed a project in 2008. A

culvert replacement project for the pavement section (MP 0 – MP 14.7) began in 2011, and is to be finished in 2012 in anticipation of a repaving project in 2014. The Rock Creek bridge is proposed for replacement in 2013.

Park Purpose and Significance

In 1917, Congress established Mount McKinley National Park: "…as a public park for the benefit and enjoyment of the people... said park shall be, and is hereby established as a game refuge" (39 Statute 938). Additions to the park were made in 1922 and 1932 to provide increased protection for park values and, in particular, wildlife.

The Alaska National Interest Lands and Conservation Act of 1980 (ANILCA) added approximately 2,426,000 acres of public land to Mt. McKinley National Park and approximately 1,330,000 acres of public land as Denali National Preserve and re-designated the entirety Denali National Park and Preserve. ANILCA directs the NPS to preserve the natural and cultural resources in the park for the benefit, use, education, and inspiration of present and future generations. ANILCA also designated 99% of the former Mt. McKinley National Park as wilderness. In addition to wilderness exclusions at Wonder Lake, Toklat, some potential gravel sources, campgrounds, and the park entrance area, a three hundred foot wide wilderness exclusion was centered on the park road.

Legal Context

The NPS Organic Act of 1916 and the General Authorities Act of 1970 prohibit impairment of park resources and values. The 2006 NPS Management Policies use the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in an unimpaired condition that will allow people to have present and future opportunities for enjoyment of them.

Relationship of Proposal to Other Planning Projects

A draft Vehicle Management Plan/Environmental Impact Statement was released for public comment during the summer of 2011. A Final Plan and EIS are expected during the summer of 2012.

Park Road repair projects are generally competitively funded by the Federal Highway Administration, Federal Lands Highway Program. Future park road projects could include bridge (Rock Creek and Ghiglione) and culvert replacement, intervisible pullout construction in the Wonder Lake area, repaving the road between the entrance and Savage River, and subexcavation work wherever replacement of poor subgrade is necessary.

Issues

To focus this EA, the NPS selected specific issues (also called "Impact Topics") for further analysis and eliminated others from evaluation. Issues selected for analysis in this EA were determined through internal scoping with the park and NPS Alaska Region staff.

Vegetation, Wetlands, and Soils – About 1 acre of willow, white spruce, and dwarf birch-dominated vegetation would be affected by the proposed road rehabilitation. Soils would be removed from the backslopes where work would occur. Wetlands would be filled or disturbed by the proposed road rehabilitation.

Wildlife and Habitat – About 1 acre of wildlife habitat next to the road would be removed.

Cultural Resources – The project would affect some dimensions and engineering of the park road. Several archeological sites exist in the Sanctuary Saddle area. The park road has been declared eligible for the National Register of Historic Places.

Visitor Use and Recreation - Recreation opportunities could be affected during the road project construction, including hiking along the road in the project area and wildlife and bird-watching from the road.

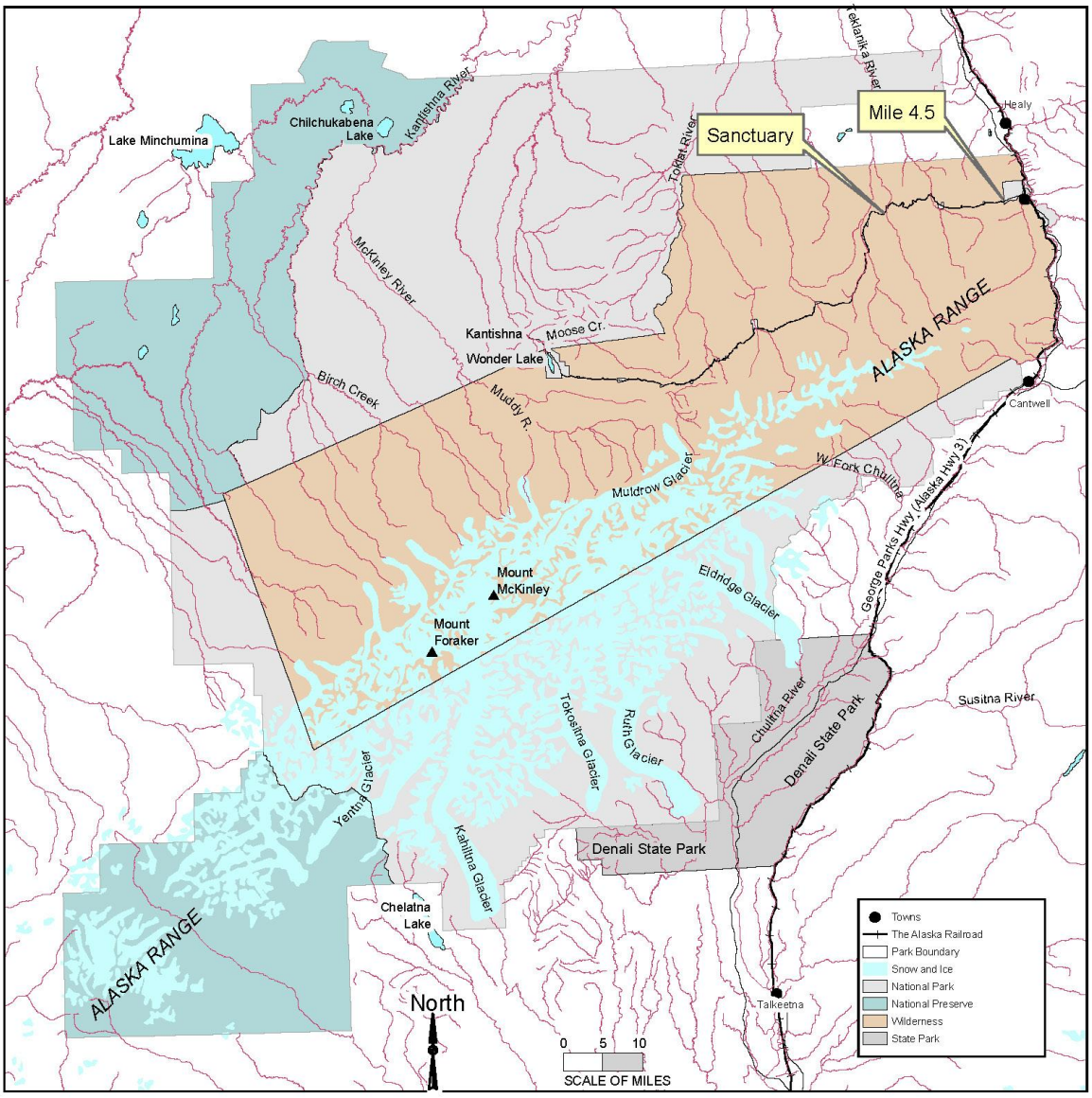
Park Management – The drainage, road surfacing, and backslope work could reduce long-term maintenance needs.

Issues Dismissed from Analysis

The following issues have been considered but dismissed from detailed analysis. Issues dismissed from detailed analysis are not addressed further in this EA.

Threatened and Endangered Species - The Endangered Species Act of 1973 (ESA) requires an analysis of impacts on all federally listed threatened and endangered species. In compliance with ESA Section (§) 7, the U.S. Fish and Wildlife Service (USFWS) has been consulted. No federally designated threatened or endangered species are known to occur within the park (Swem 2000) and none are anticipated to be affected by this project.

Air Quality - Both the Clean Air Act of 1977 (CAA) and NPS 2006 Management Policies (NPS 2006b) require the NPS to consider air quality impacts from their projects. The park is a Federal Class 1 Air Quality Area under the CAA. Air quality is monitored near park headquarters and no exceedances of National Ambient Air Quality Standards have been documented within the park. Construction within the park associated with this project would result in short-term, minor, impacts on air quality. Class I air quality standards would not be exceeded by this project.



Location in Alaska

Figure 1
Project Location
Denali National Park and Preserve
U.S. Department of the Interior • National Park Service

Water Quality – Water would be pumped from the Sanctuary River and used by water trucks to keep the dust down or to be used in compacting lifts when adding wear layers to the road. The amount of water to be pumped is negligible compared to the river discharge.

Local Communities/Socioeconomic Resources - Construction activities and costs associated with the proposed project would provide a temporary stimulus to the local or regional economy. Wages, overhead expenses, material costs, and profits would last only as long as the project, thus impacts to local communities and socioeconomic resources would be short-term. Travel delays during construction would be minimized. Specific work items in the contract that would close the road for hours would be done at night, in consultation with the businesses in Kantishna.

Environmental Justice - Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed project would not result in significant changes in the socioeconomic environment of the area, and is expected to have no direct or indirect impacts to minority or low-income populations or communities.

Floodplains - E.O. 11988, Floodplain Management, requires all federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. The project site is not located in floodplains, so this impact topic does not apply.

Soundscapes - Natural soundscapes in the area would be impacted by construction activities over the length of the project, but these impacts would be temporary and would be similar in kind to those already occurring from routine road maintenance, such as dump truck and motor grader use.

Subsistence - Subsistence activities are not allowed in the project area, so this impact topic does not apply. An ANILCA §810 evaluation is included in Appendix A.

Wilderness - Project activities would not occur in designated or eligible wilderness. Construction would not directly encroach upon the designated wilderness area. Sounds from the project would temporarily be heard in adjacent wilderness. Much of the use of the wilderness area (to the north) would have topographic barriers attenuating or blocking the noise from the project equipment. An existing road materials stockpile area at MP 5.0 would be used for staging during project activities. It has been used for road maintenance since before the 1980 ANILCA legislation that designated the park wilderness. The non-wilderness area of the park road corridor in this area extends 150 feet from the park road centerline. The road maintenance area at MP 5.0 extends beyond the 150 foot limit. In the wilderness boundary legal description, this MP 5.0 road maintenance area is not mentioned. However, the boundary description has a note that:

> *Along the existing (on December 2, 1980) highway through the park, the wilderness boundary begins 150 feet on either side of the center line of the road and 150 feet back from the edge of all existing (on December 2, 1980) turnouts and parking areas (Report of the Committee on Energy and Natural Resources,*

U.S. Senate, Report Number 96-413, page 216). This information supplements and amends, as necessary, the foregoing descriptions.

This boundary description note clarifies that the existing MP 5.0 road maintenance area is non-wilderness and its use as a staging area is not a wilderness impact issue.

Permits and Approvals Needed to Implement the Project

A concurrence from the State Historic Preservation Officer will be required for the Assessment of Effect of this project on cultural resources.

A Section 404 permit would be required from the Corps of Engineers because the wetlands involved include a direct link to navigable waters.

Clean Water Act §402(p) - [33 U.S.C. 1342(p)] Construction projects that expose more than 1 acre of cleared land to erosion and runoff require a National Pollution Discharge Elimination System permit from the U.S. Environmental Protection Agency (USEPA). A Notice of Intent (NOI) would be provided to USEPA to use the Construction General Permit. A copy of the NOI would be provided to the ADEC for comment. The construction contractor would be required to prepare a Storm Water Pollution Prevention Plan for submission to ADEC.

II. ALTERNATIVES

Definitions, as used in this document (see Figures 5 and 6):

Riprap Blanket – an 18 inch thick layer of Class 2 rock, laid on the backslope above the road to help keep the wet or frozen slope in place as that slope adjusts to the removal of the surface vegetation and soils. The riprap blanket would have a geotextile fabric underneath for conducting water and to keep the rock from being incorporated into the soft soils below. The riprap blanket is not designed with a rock toe extending under the ditch, and does not include a foam layer. A 6 inch topsoil layer is to go on top of the rock and is to receive a local seed mix.

Slope Blanket with Underdrain – an 18 thick layer of Class 2 rock, laid on the backslope above the road to strengthen the backslope against downhill migration into the road ditch. The blanket would have a geotextile fabric at the base, with 4 inches of polystyrene foam above the fabric and with a 6 inch crushed aggregate layer to cushion the foam from the Class 2 rock above. The foam would help insulate the permafrost under the structure from warm air temperatures. The 18 inch blanket would extend as a toe under the ditchline, without the foam layer. An 8-inch diameter perforated pipe would be embedded in the toe of the buttress to help drain water toward relief culverts and would run under the ditch parallel to the road. A 6 inch topsoil layer is to go on top of the rock and is to receive a local seed mix.

Rock Buttress with Underdrain – the Rock Buttress with Underdrain is designed the same way as the Slope Blanket except that the Rock Buttress would have a 30 inch depth of riprap for use in more unstable sections of the park road backslope.

Alternative 1 – No Action

Under the No Action Alternative, the NPS and FHWA would not complete the proposed road rehabilitation project in the MP 4.5 or Sanctuary Saddle areas. Existing use and maintenance of the road would continue. Annual maintenance activities of adding crushed gravel or screened pit run material to maintain a safe driving surface would continue, as would blading the ditches and maintaining culverts. Brush crews would continue to clear brush alongside the road according to the directions in the Denali Road Maintenance Standards (NPS 2006). Current structural issues such as slumping backslopes, water in the ditches and plugged culverts would remain.

Alternative 2 – Intensive Rehabilitation of the Park Road in the MP 4.5 and Sanctuary Saddle Areas, (Mile 24.3 – 25.0) (NPS Preferred Alternative)

General Descriptions

At MP 4.5 under Alternative 2, the NPS and FHWA propose to continue backslope work begun in 2008 by installing 1,256 linear feet (approximately 55,000 square feet or 1.3 acres) of 12 inch thick riprap blanket on the remaining cut slopes from 2008 in the MP 4.5 project area. The riprap blanket sections and fill slopes would be covered with conserved topsoil from earlier nearby excavations. Disturbed sites within the project area would be replanted with native vegetation, following the Native Plant Revegetation Manual for Denali National Park and Preserve (U.S. Geological Survey 2000).

Repair work in the Sanctuary Saddle area would include installing slope blanket and rock buttress sections above the road, constructing standard underdrains, performing ditch reconditioning, replacing culverts, cleaning drainage windows, providing some short grade raises, placing an 8 inch lift of surface wear material, and adjusting the road width to meet standards. These repairs would affect about 38,000 square feet (0.9 acres) above the existing ditch and backslope. Passing pullouts would not be required because the road is 24 feet wide or wider in this section. Subexcavation of the road prism is planned to remove one bump and other soft base material. Of the 2,265 feet of road in the project area, approximately 4% of the project width is at 24 feet, 29% is at 26 feet, and 67% is at 28 feet or wider. The road width would be set at 26 feet for the project area. Improvements to the road are based on the park's Road Design Standards (RDS), which is a quantitative version of the Road Management summary given in the park's Entrance Area and Road Corridor Development Concept Plan/Environmental Impact Statement (NPS 1996a).

Riprap Blanket

Install approximately 1,256 linear feet of riprap blanket in 8 segments at MP 4.5 above the road. The blankets would vary from twenty feet in upslope length to sixty feet in upslope length and would cover approximately 55,000 square feet of slope.

No riprap blanket work is proposed for the Sanctuary Saddle area.

Slope Blanket

Install approximately 1,060 linear feet of slope blanket in 2 segments in the Sanctuary Saddle above the road. The blankets would vary from 20 feet in upslope length to 40 feet in upslope length (average 25 feet) and would cover approximately 26,500 square feet of slope.

No slope blanket work is proposed for the MP 4.5 area.

Rock Buttress

Install approximately 305 linear feet of rock buttress in one segment in the Sanctuary Saddle above the road. The rock buttress would vary from 25 feet in height to 35 feet in height (average 30 feet) and would cover approximately 9,150 square feet of slope.

No rock buttress work is proposed for the MP 4.5 area.

Underdrains and Ditch Reconditioning

For the Sanctuary Saddle section underdrains would be built into the Slope Blanket and Rock Buttress segments. Approximately 270 feet of "ditch reconditioning" would involve shaping the ditch so that water keeps flowing to the next culvert, rather than forming pools in the ditch.

No new underdrains are planned for MP 4.5. The uphill ditch would be returned to its shape in 2008 by removing slumped material.

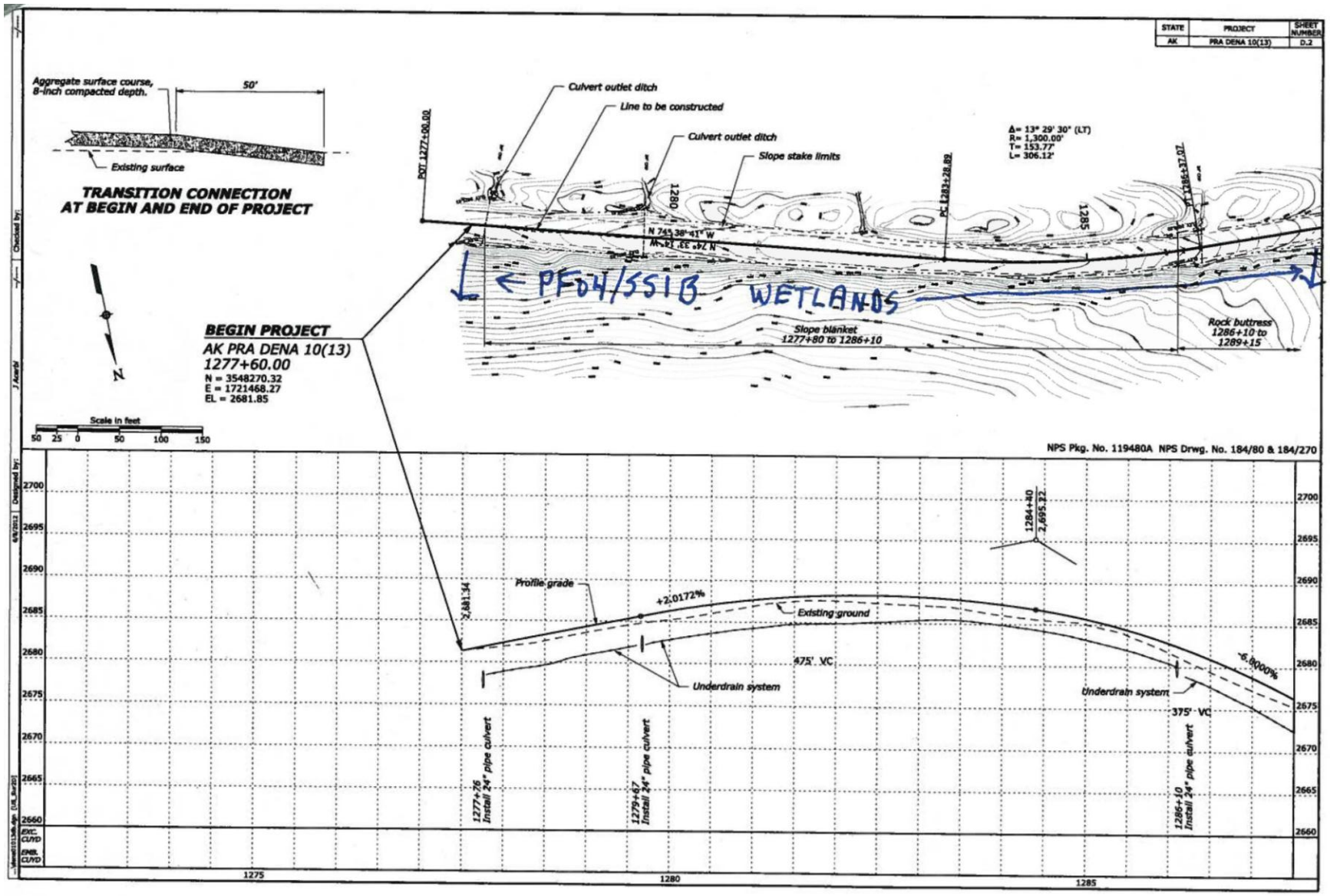


Figure 2
Sanctuary Plans East

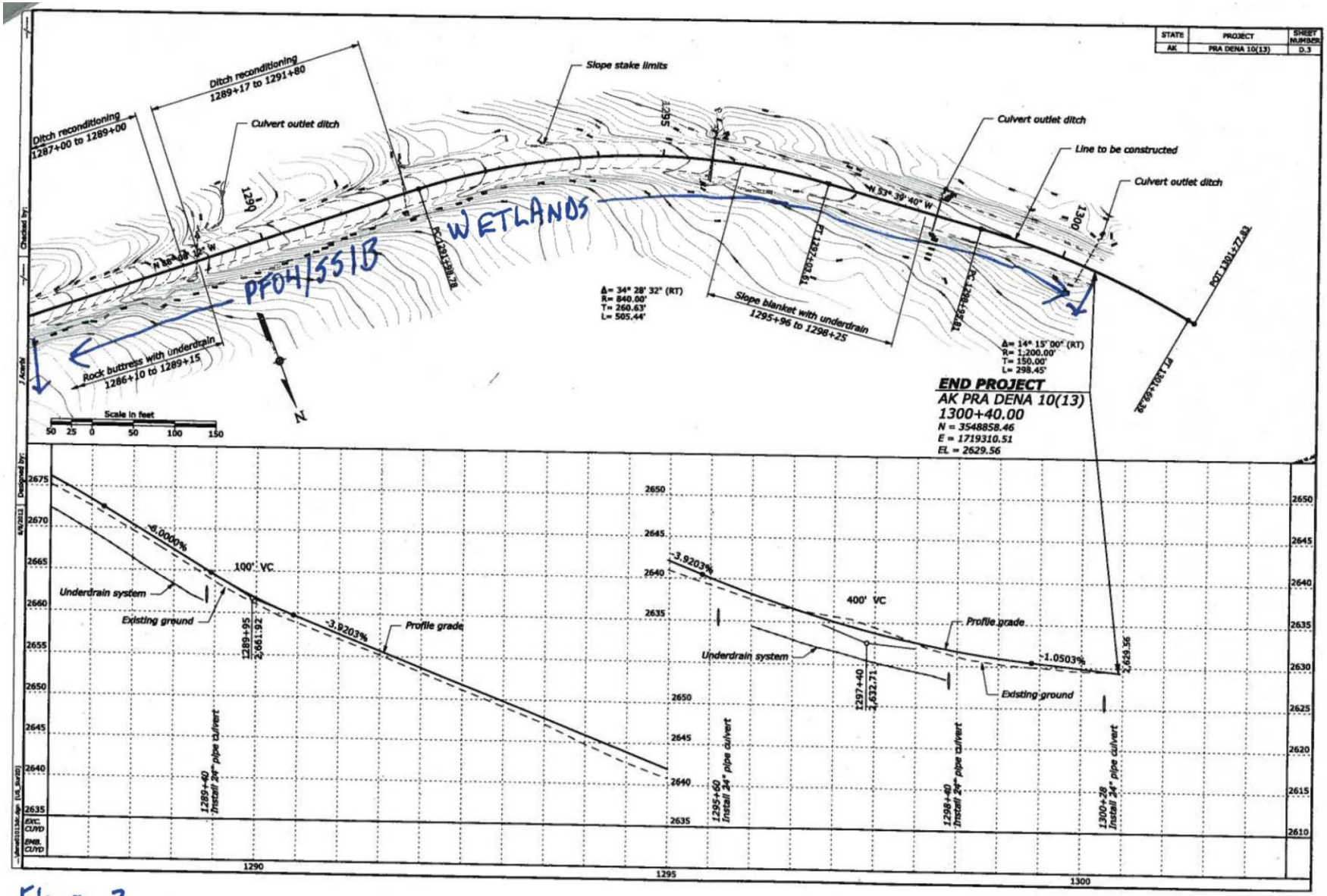


Figure 3
Sanctuary Plans West

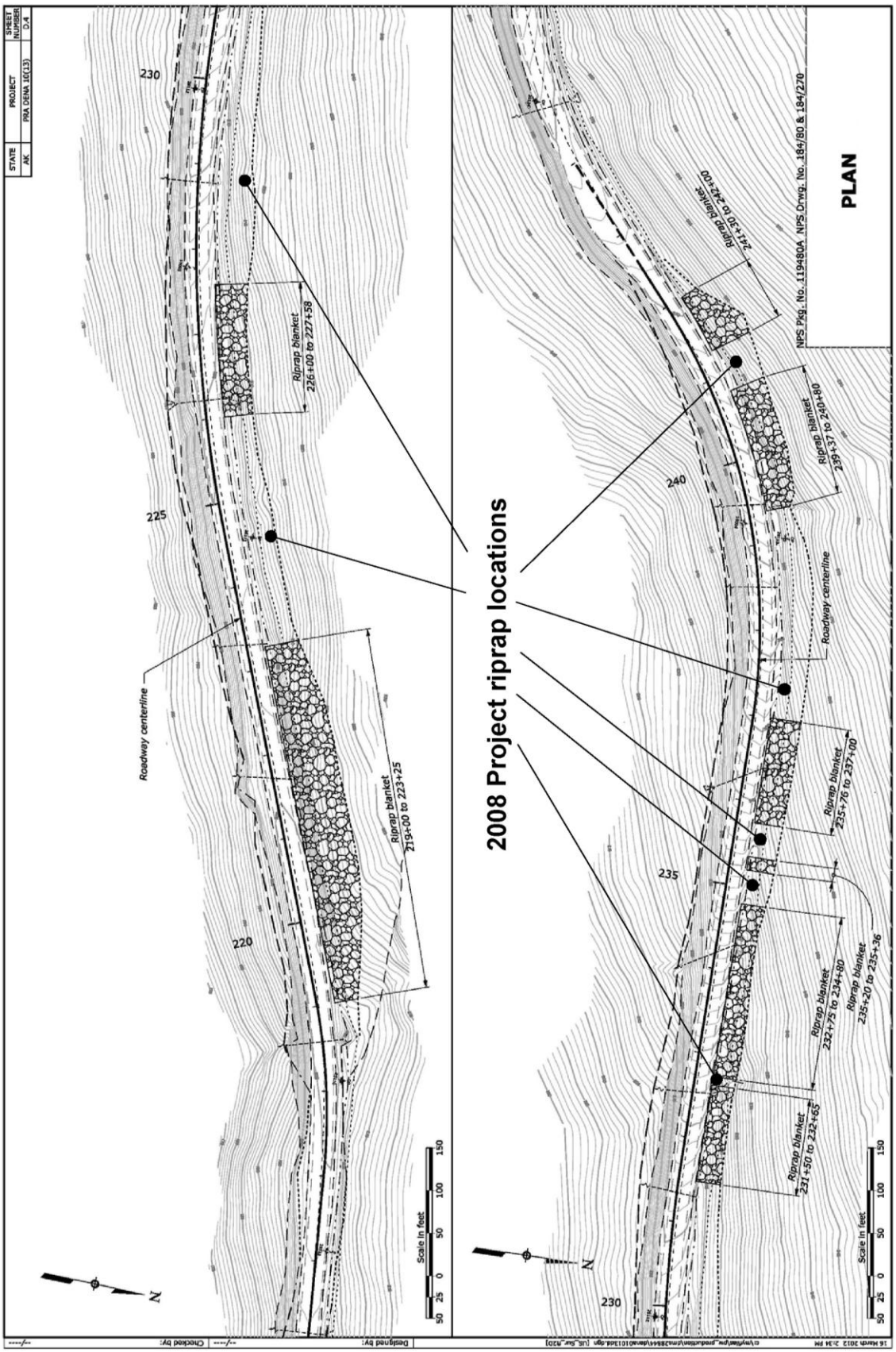


Figure 4
mp 4.5 - Plans

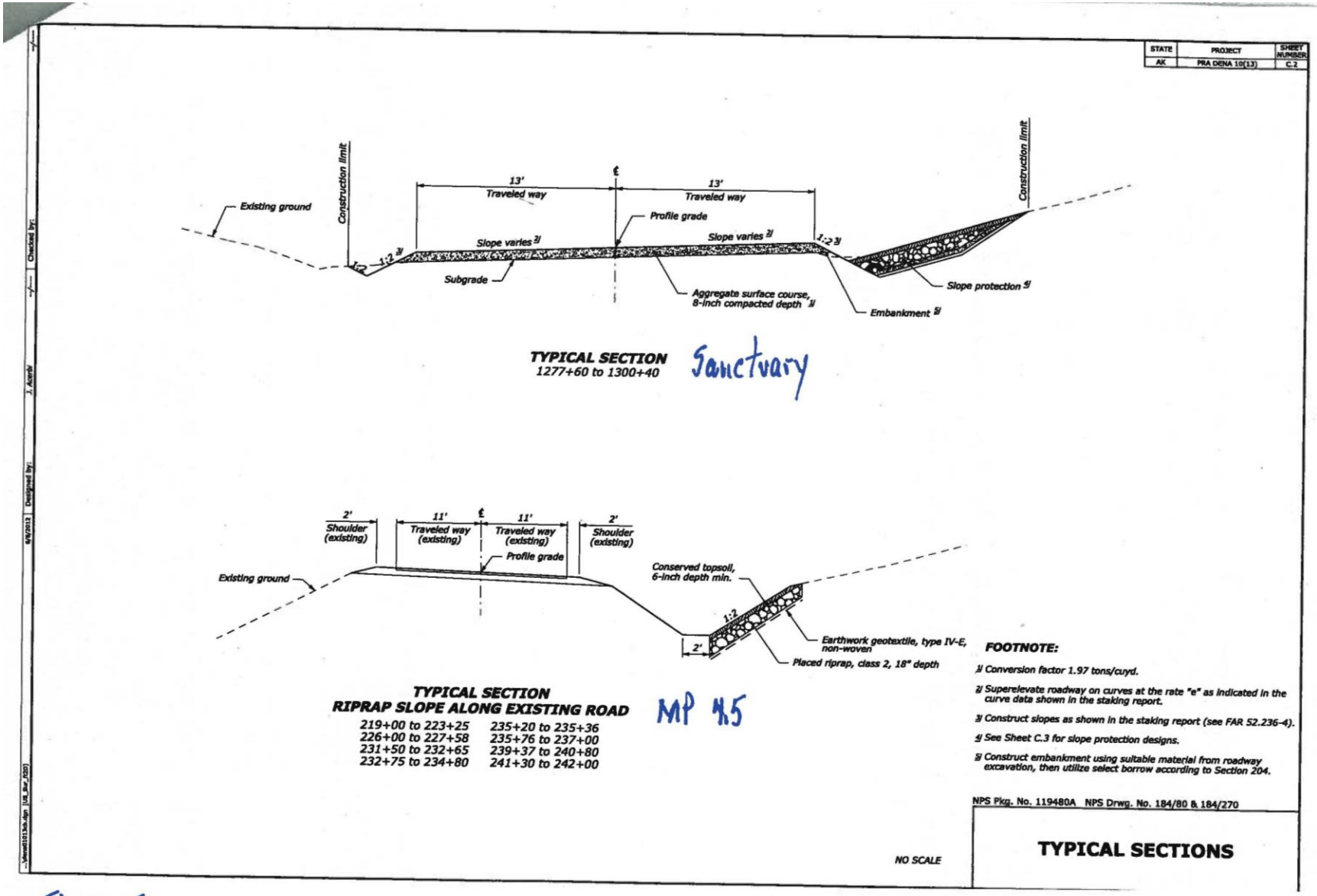


Figure 5
Typical Sections

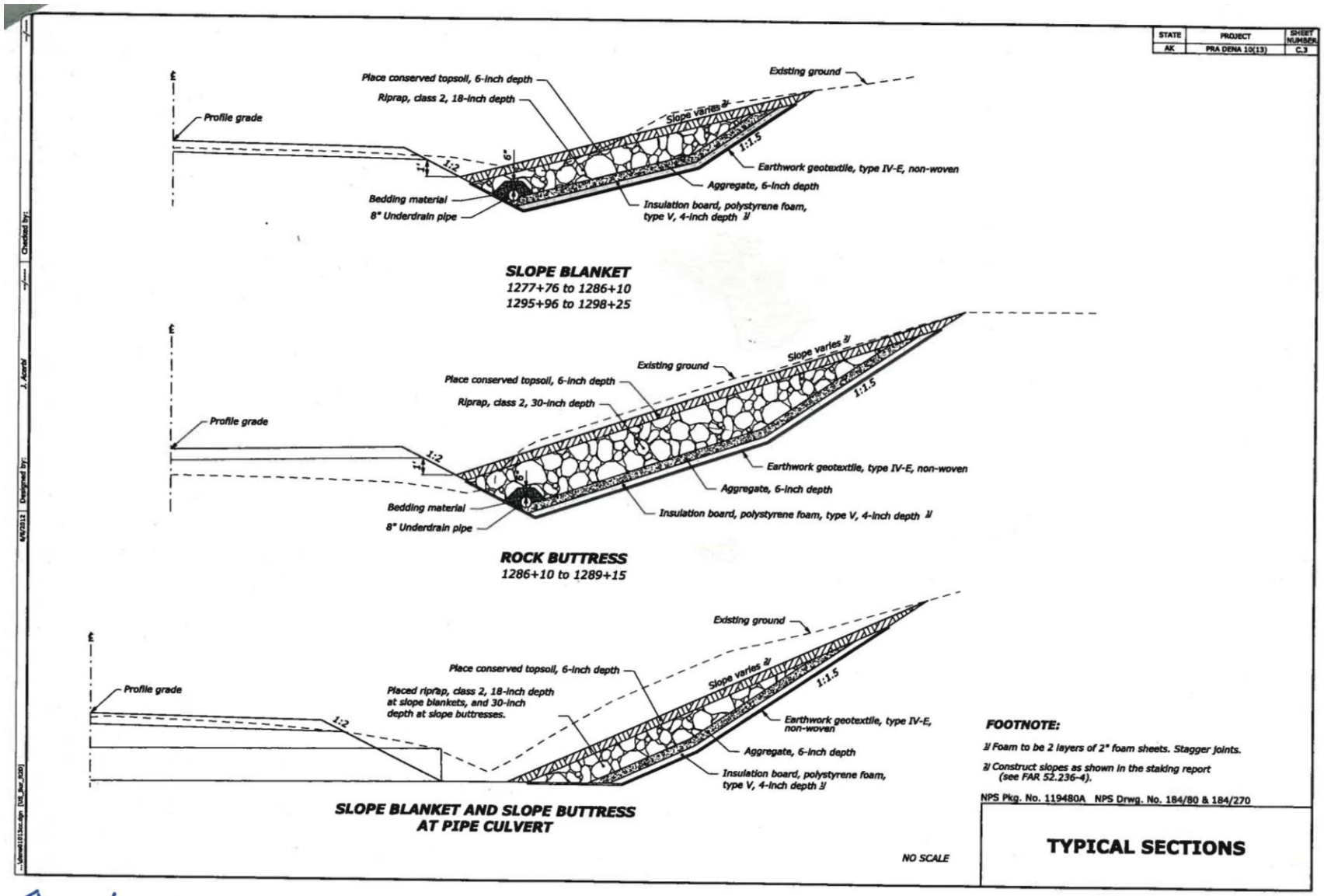


Figure 6
Typical Sections

Surface Work

Improve the road surface at the Sanctuary Saddle by adding an 8-inch road surface wear layer in the project area, while reshaping the crown or superelevation and keeping the existing width of road travel surface. An average of ¼ inch of material wears off the road surface during each year. Superelevation is tilting the whole roadway to help offset inertial forces developed as the vehicle goes around a curve, and superelevations would be used on short radius corners that are now crowned. Superelevations and crowns are both limited to 6% for this segment of road, and 3% and 4% would typically be used in situations where a 6% superelevation would elevate the outside of the road and create a wider and deeper fill slope. Crowns would typically be at 3%. The crown or superelevation would be varied as necessary to connect the curves and straight sections.

No surface work is proposed at MP 4.5.

Culverts and Drainage Windows

Replace seven culverts in the Sanctuary Saddle area. All replacement culverts would have a 24" diameter. The replacement of culverts would be scheduled to be done at night. The road profile would be raised over one culvert intake as the profile is changed from a crown section to a superelevation section. Drainage windows are 2 foot wide cuts through the soils and vegetation below the road that allow water to flow away from the road. These windows are especially useful where the land below the road is almost level. No new drainage windows would be needed. All the drainage windows would be cleaned out, though no work would extend beyond the wilderness boundary.

No new culverts or drainage windows are planned for MP 4.5.

Section Dimensions

The park road in the project area would be given a uniform width of 26 feet. No changes would be made to the road dimensions in the MP 4.5 area.

Material and Equipment Required

Improvements at the Sanctuary Saddle area would be constructed with heavy equipment, such as 10 and 18 ton end-dumps and belly dumps, motor graders, and either large excavators, backhoes, or front-end loaders to excavate for culvert replacement and backslope work. A gas-powered pump would be set up near the west end of the Sanctuary River bridge to pump water into a 3,000 gallon water truck. Some water may be used to control road dust, and the rest would be used while compacting the lifts during resurfacing.

Approximately 1,700 cubic yards (cy) of surfacing material (D-1 gravel) would be needed for the Sanctuary Saddle project, as would about 950 cy of select borrow (subbase) and 1,300 cy of Class 2 rock, although these quantities may change somewhat with further refinements in design. All of material would be trucked to the project site from outside the park sources. Reusable material removed from the roadbed would be hauled to the MP 27 Teklanika Pit for recycling and possible use as select borrow, surfacing binder additive, or topsoil for reclamation. Material determined as unusable would be backhauled out of the park by trucks delivering rock or gravel to the project site. Some reject material may be used in pit rehab work at the Teklanika Pit.

Equipment used at MP 4.5 would be the same as used at the Sanctuary Saddle. Approximately 2,750 cy of Class 2 rock would be required for the backslope work, and it would be trucked to the project site from outside the park sources. Around 2,200 cy of topsoil would be trucked to the site to cover the riprap from the 2008 project.

Revegetation of Disturbed Areas

All backslopes covered by riprap would have a 6 inch layer of topsoil placed above the rock. If the topsoil is saved material from the site, the seed bank within the soil would start the revegetation process. If clean topsoil is provided, the park would provide local seeds to start revegetation.

The road work is scheduled for the summer of 2013.

Project Cost

The estimated cost of the project is $1.1 million.

Alternative 3 – Rehabilitation of the Park Road in the MP 4.5 and Sanctuary Saddle Areas, (Mile 24.3 – 25.0)

General Descriptions
At MP 4.5 under Alternative 3, backslope work would conclude by applying a 6 inch layer of clean topsoil to the 1044 linear feet of riprap blanket installed in 2008. Native seed would be applied by park staff to the new topsoil. Other bare slopes within the 2008 project area would be replanted with native vegetation, as necessary, following the Interior Alaska Revegetation Plan (U.S. Geological Survey 1994). Material that has slumped into the ditch at two areas would be removed by heavy equipment, as would any future slump.

Repair work in the Sanctuary Saddle area would include installing standard underdrains, performing ditch reconditioning, replacing culverts, cleaning drainage windows, providing some short grade raises, placing an 8 inch lift of surface wear material, and adjusting the road width to meet standards. No passing pullouts would be required because the road is 24 feet wide or wider in this section. Subexcavation of the road prism is planned to remove one bump and other soft base material. Of the 2,265 feet of road in the project area, approximately 4% of the project width is at 24 feet, 29% is at 26 feet, and 67% is at 28 feet or wider. The road width would be set at 26 feet for the project area. Improvements to the road are based on the park's Road Design Standards (RDS), which is a quantitative version of the Road Management summary given in the park's Entrance Area and Road Corridor Development Concept Plan/Environmental Impact Statement (NPS 1996a).

Riprap Blanket
No riprap blanket work is proposed.

Slope Blanket
No slope blanket work is proposed.

Rock Buttress
No Rock Buttress work is proposed.

Underdrains and Ditch Reconditioning
Install up to 2,290 feet of standard ditch underdrain under the section of uphill ditch that is prone to weep all summer long (see cover picture). An 8 inch diameter perforated pipe would extend throughout the length of the underdrain sections and would empty into 8 inch diameter outlet pipes every 150 to 300 feet. Installing the underdrain would require reconditioning and shaping and then maintaining the ditch above the underdrain so that water keeps flowing to the next culvert, rather than forming pools in the ditch.

No new underdrains are planned for MP 4.5. The uphill ditch would be returned to its shape in 2008 by removing slumped material.

Surface Work
Improve the road surface at the Sanctuary Saddle by adding an 8-inch wear layer in the project area, while reshaping the crown or superelevation and keeping the existing width of road travel surface. An average of ¼ inch of material wears off the road surface during each year. Superelevation is tilting the whole roadway to help offset inertial forces developed as the vehicle goes around a curve, and superelevations would be used on short radius corners that are now crowned. Superelevations and crowns are both limited to 6% for this segment of road, and 3% and 4% would typically be used in situations where a 6% superelevation would elevate the outside of the road too high and create a wider and deeper fill slope. Crowns would typically be at 3%. The crown or superelevation would be varied as necessary to connect the curves and straight sections.

No surface work is proposed at MP 4.5.

Culverts and Drainage Windows
Replace seven culverts and install three new ones in the Sanctuary Saddle area. All replacement culverts would have a 24" diameter. The replacement of culverts would be scheduled to be done at night. The road profile would be raised over one culvert intake as the profile is changed from a crown section to a superelevation section. Drainage windows are 2 foot wide cuts through the soils and vegetation below the road that allow water to flow away from the road. These windows are especially useful where the land below the road is almost level. No new drainage windows would be needed. All the drainage windows would be cleaned out, though no work would extend beyond the wilderness boundary.

No new culverts or drainage windows are planned for MP 4.5.

Section Dimensions

The park road in the project area would be given a uniform roadway width of 26 feet. No changes would be made to the road dimensions in the MP 4.5 area.

Material and Equipment Required

Improvements at the Sanctuary Saddle would be constructed with heavy equipment, such as 10 and 18 ton end-dumps and belly dumps, motor graders, and either large excavators, backhoes, or front-end loaders to excavate for material replacement, underdrain work and culvert replacement. A gas-powered pump would be set up near the west end of the west side of the Sanctuary River bridge to pump water into a 3000 gallon water truck. Some water may be used to control road dust, and the rest would be used while compacting the lifts while resurfacing. The road work and associated gravel processing is scheduled for the summer of 2013.

Approximately 1,700 cubic yards (cy) of surfacing material (D-1 gravel) would be needed for the Sanctuary Saddle project, as would about 950 cy of select borrow (subbase) and 750 cy of drain rock, although these quantities may change somewhat with further refinements in design. All of material would be trucked to the project site from outside the park sources. Reusable material removed from the roadbed would be hauled to the Teklanika Pit for recycling and possible use as select borrow, surfacing binder additive, or topsoil for reclamation. Material determined as unusable would be backhauled out of the park by trucks delivering rock or gravel to the project site. Some reject material may be used in pit rehab work at the Teklanika Pit.

Equipment used at MP 4.5 would include excavators/backhoes and dump trucks. An excavator and trucks would be needed to remove the slumped material and place topsoil on the 2008 project riprap.

Revegetation of Disturbed Areas

Around 1,000 cy of topsoil would be trucked to the MP 4.5 site to cover the riprap from the 2008 project. If topsoil can be found from nearby park projects the seed bank within the soil would start the revegetation process. If clean topsoil is provided, the park would provide local seeds to start revegetation.

Project Cost

The estimated cost of the project is $0.3 million.

Environmentally Preferable Alternative

Alternative 3 (Rehabilitation of the Park Road in the MP 4.5 and Sanctuary Saddle Areas) is identified as the Environmentally Preferable Alternative because it does not disturb new ground, it covers the 2008 riprap project with topsoil to create additional wildlife habitat where none exists now, and the drainage work at Sanctuary would be designed to better move water downslope from the road prism toward the wetlands below the road.

Mitigation and Monitoring

Mitigation measures are specific actions that when implemented reduce impacts, protect park resources, and protect visitors. The following mitigation would be implemented under each action alternative and are assumed in the analysis of effects.

Vegetation. Construction limits would be marked at all work areas to help ensure that vegetation outside the areas to be rehabilitated does not get trampled or torn up during the work. Disturbed areas would be monitored for any exotic plants. Silt fences or sediment wattles would be installed to diminish erosion and turbidity below the road where backslope or underdrain work is happening. Gravel or riprap would come from outside park borrow sources certified to be weed free. Contractor equipment must be pressure washed or certified to be weed free prior to entering the park.

Air Quality. Dust would be produced by the additional truck and construction traffic on the gravel park road. These impacts would be partially mitigated by use of a water truck during construction activities to keep the dust down.

Wildlife and Habitat. The NPS would follow established guidelines in the park's bear-human conflict management plan. The plan requires contractors and staff to use bear-proof containers for food and refuse and sets up guidelines for temporary closures. Vegetation clearing would be done outside of the April 1 to August 1 nesting season so as to not impact nesting or fledging. Any occupied nests discovered would be protected at all times. Shrubs within 5 meters of the road edge are subject to road maintenance activities and are available for removal at any time under an agreement with the U.S. Fish and Wildlife Service.

Cultural Resources. Several archaeological sites exist near the Sanctuary Saddle area, and the park road has been determined eligible for listing on the National Register of Historic Places. If previously unknown cultural resources were located during construction, the project would be halted in the discovery area until cultural resource staff could determine the significance of the finding. Further archeological surveys may be needed in areas where ground disturbance would occur. The project manager would work closely with the park archeologist regarding project timing of implementation to ensure cultural resources are identified, avoided and protected. If previously unknown cultural resources were located during construction, the project would be halted in the discovery area until cultural resource staff could determine the significance of the finding.

Visitor Use and Recreation. Visitors, Kantishna lodge owners, and bus drivers would be advised in park announcements, programs, and publications that there would be temporary inconveniences from construction work on the road. Culvert replacement or other work that would close the road for hours would be scheduled to be done at night.

In all cases traffic control and safety shall be maintained. The Contractor shall include proposed daytime work protocols in its Quality Control Plan and its Safety Plan to show how their monitoring and controls would be implemented.

Table 1. Comparison of the Alternatives

Road Changes	Alt. 1 – No Action	Alt. 2 – Intensive Rehab NPS Preferred	Alt. – Road Rehab
Riprap Blanket	None added	2,600 linear feet added	None added
Revegetation	None added	3,800 linear feet of topsoil added to cover riprap in both areas.	1,000 cys of topsoil added to cover riprap from 2008 project at MP 4.5
Underdrains	None added	Install 534 feet of underdrains as part of riprap treatment at Sanctuary Saddle	Install up to 2,350 feet of underdrains at Sanctuary Saddle.
Ditch Reconditioning	No attention above normal.	Part of project.	Part of project.
Road Width Standard	1/4 of Sanctuary Saddle area exceeds standard	Reshape road to width standard.	Reshape Road to Width standard.
Initial Costs	none	$1.1 million	$0.3 million
Annual Maintenance Costs	$15,000	$10,000	$20,000
20 year Annual Lifecycle costs	$15,000	$65,000	$35,000

Table 2. Summary Impacts of the Alternatives

Impact Topic	Alt. 1 – No Action	Alt. 2 – Intensive Rehab NPS Preferred	Alt. – Road Rehab
Vegetation, Soils, Wetlands	Some soils would continue to slide into road ditch. No impact to wetlands and vegetation.	Moderate impact from removal of 0.9 acres of vegetation, including 0.9 acres of wetlands and 1.3 acres of disturbed soils,	Some soils would continue to slide into road ditch. No impact to vegetation and wetlands.
Wildlife and Habitat	None affected.	Temp. impact during construction. Moderate impact from removal of 0.9 acres of wildlife habitat.	Temp. impact during construction. No habitat removed.
Cultural Resources	No impact.	Minor impact to road character from smoothing vertical alignment at Sanctuary Saddle and extending an unforested backslope. No impact to other known cultural sites.	Minor impact from smoothing vertical alignment at Sanctuary Saddle
Visitor Use and Enjoyment	Negligible impact from uncovered	Temp. impact from delays and noise during	Temp. impact from delays and noise during construction.

	riprap slope.	construction. Minor visual impact from extensive new backslopes with low cover.	Negligible visual impact.
Park Management	Road areas threatened by sliding material that can fill the ditch.	Moderate beneficial impact by protecting ditches in both areas.	Minor beneficial impact by cleaning and re-shaping ditches, adding culverts and underdrain.

III. AFFECTED ENVIRONMENT

Detailed descriptions of the environment in the entrance and road corridor areas may be found in the 1986 GMP and the 1996 DCP/EIS. This section summarizes the natural and human environment that may be affected by the proposal and alternatives under consideration.

Vegetation, Wetlands and Soils

The park road in the MP 4.5 area is on a south-facing slope and traverses a mix of vegetation and soils types. Vegetation at MP 4.5 is dominated by willow and dwarf birch, with groves of white spruce on the drier soils. Water emerges from small seeps within 700 feet above the road and saturated soils covered by wetland vegetation types are common. Permafrost is discontinuous but is also common above the road. A rehabilitation project here in 2008 involved installing 1,044 linear feet of a 12 inch thick rock blanket to cover the exposed backslope above the road. The backslope for the full length of the 2,300 foot-long project had the vegetation and soils removed to create a large area to store winter ice. Colluvium covers the slope, but is thinner on buried ridges which are exposed as drier ground in the road backslope. The sections of the backslope that were known to be weeping prior to the 2008 project were given riprap blanket treatment and those have generally held up well, although some have slumped a foot or two. Some intermediate areas on drier soils have stabilized, even with the vegetative cover and upper soil layers removed. A couple of sections covering from 250 to 300 linear feet that had the backslope scraped but did not get a riprap treatment have partially slumped into the ditch (see picture inside cover).

A wetlands map of the project area was made from 2006 pedestrian surveys and air photo interpretation by park staff familiar with the local conditions (Carwile 2007). All of the mapped wetlands in the project area are "jurisdictional" according to the USACE (Allen Skinner, pers. comm.). Under the Cowardin Classification System outlined in "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al. 1979), the project area wetlands are classified as: palustrine forested, needle-leaved evergreen, saturated wetlands (PF04B); palustrine scrub-shrub, broad-leaved deciduous, saturated wetlands (PSS1B); and riverine intermittent, vegetated streambed wetlands (R4SB7). These wetlands were disturbed by having vegetation and soils removed in 2008 and compensation for that loss was accomplished by a project in the Glen Creek area of the Kantishna Hills. No further compensation is required to place riprap on the already disturbed backslopes at MP 4.5.

Vegetation in the palustrine forested wetlands is typically dominated by white spruce-black spruce hybrids (Viereck et al. 1992). The understory shrub layer consists of both low and tall shrubs such as willow (*Salix* spp.), Labrador tea (*Ledum* spp.), lowbush cranberry (*Vaccinium vitis-idaea*), and bog blueberry. Common ground cover includes peat mosses (*Sphagnum* spp.), herbaceous species like field horsetail (*Equisetum arvense*), a few flowered sedges (*Carex pauciflora*), and a variety of forbs (NPS 2007).

The park road in the Sanctuary Saddle area crosses the drainage divide between the Sanctuary and Teklanika rivers. The road is on a south-facing slope that comprises the lowest and

shallowest slope on the south side of Mt. Wright, and is generally just upslope of the lowest ground in the Sanctuary-Teklanika drainage divide. Vegetation above the road here is dominated by willow and dwarf birch, with a scattering of white spruce. Saturated soils covered by wetland vegetation types are the norm. Permafrost may be mostly continuous above the road. Soil conditions are dynamic as the soils become less stable as the permafrost melts, possibly as a result of climate change. Fissures in the soil above the road indicate that soil blocks separate under gravity and move downhill. The slope above the road slides or falls into the ditch in lesser or greater quantities throughout a normal summer (see cover picture). No treatment of the backslope has occurred. Some drainage windows have been carved by hand or by excavators into the soils below the road at culverts to permit water to flow away from the ditch.

Past actions such as initial construction, annual snow and ice removal, and drainage improvements, have disturbed the soils and vegetation along a margin a few feet wide adjacent to the road prism and ditches. In cases where soil from the ditch or elsewhere has been mechanically moved (bermed) onto adjoining soils, a drier surface soil environment was created over the years - especially on the downhill side of the road- that aided the growth of some plant types, such as certain willow species. There are current and ongoing efforts by the park to inventory, monitor and treat non-native vegetation along the road.

Wildlife and Habitat

The most common wildlife species in both project areas are red fox, snowshoe hares, voles and other small mammals, and various birds such as ptarmigan, ravens and numerous migratory species such as sparrows, warblers, northern harriers and short-eared owls. The area also provides moose habitat throughout, including willow browse. Grizzly bears use the slopes above and below the road for blueberries and crowberries. Wolves and caribou may also be found traversing the areas.

The Sanctuary Saddle is along a migration route of Dall sheep as many of them, especially ewes and lambs, move from winter and spring habitat on Mt. Wright to summer habitat on higher mountains to the south. Southward sheep migrations in the three years of a study (1995-1997) happened between May 10 and July 7, and return migrations were observed from August 23 to October 19 (NPS 1998). A table of historic migration reports presented in the study showed that migration south ranged from May 4 to July 27, and migration back ranged from July 30 to November 2. The main trail used by the sheep in the study was 0.1 miles west of the end of the project area.

Cultural Resources

Surveys for cultural resources have taken place in the road corridor over the past two decades. Several cultural resources are known from the Sanctuary Saddle section of road, including several small archaeological sites and the park road itself. The park road is the only known cultural resource in the Mile 4.5 area. It is possible that additional archaeological sites exist near the road but vegetation growth has obscured their locations. The proximity of sheep migration routes and the Teklanika Archaeological District to the Sanctuary Saddle area suggest that further archaeological surveys could find additional sites.

The Denali Park Road is the most obvious cultural resource in the area. The Park determined that the Road was eligible for the National Register of Historic Places which the State Historic Preservation Officer concurred with in 2009. A draft Cultural Landscape Report was produced in 1999, but it did not include a Treatment section and was not finalized. Projects involving the park road are reviewed by the park Section 106 coordinator per the Systemwide Programmatic Agreement and may require formal consultation with the State Historic Preservation Officer. An Assessment of Effects to Cultural Resources was prepared to evaluate impacts to known cultural resources, including the Denali Park Road, a historic property eligible for the National Register of Historic Places.

Visitor Use and Recreation

All park visitors are free to visit the MP 4.5 area of the park, as it is on the unrestricted section of the park road. It is not a notable hiking area, given the often wet soils and non-alpine environment. Some day-hiking is popular downhill of the road in this area, with hikers interested in the Drunken Forest on the other side of the valley bottom.

Around 225,000 people travel the Sanctuary Saddle section of the Denali Park Road annually, with about half of those travelling on park concessioner Tundra Wilderness Tour buses, and the rest on park Shuttle or Camper buses or Kantishna Lodge buses. A few thousand also drive to campsites at the Teklanika Campground. The 1996 DCP/EIS put all of this section of road into the Wildlife Viewing Sub-Zone 2.

> "This sub-zone includes the gravel section of the park road on which greater restrictions (Rules of the Road) apply. Buses are given the right-of-way and the primary purposes include wildlife and scenery viewing. Visitors must use one of the bus systems and private vehicles are restricted. The only facilities include the park road, one or two visitor contact stations, and generally one rest area for every hour of travel. Visitors can expect a lower level of traffic than in wildlife viewing sub-zone 1."

The backcountry surrounding the road is used by hikers and backcountry campers to explore Mt. for its views of the Alaska Range, its alpine terrain hiking opportunities and opportunities for seeing wildlife. The local backcountry units are generally filled to the limits all season with overnight campers (maximum 28 per night in 5 local units). The number of day hikers is not known, but likely peaks at about 20 per day.

Park Management

Park management has responded to the aufeis problems in the MP 4.5 area of the park road for decades, using explosives, burn barrels, bulldozers, drain rock and oversize culverts to remove ice from the road surface or to drain the water away from the uphill side of the road before it turns into ice in winter. The 2008 project to enlarge the uphill ditch and to install numerous 8 foot diameter culverts has resulted in no more than 1 foot of ice on the road in the spring and reduced the 3 weeks of time to remove the ice down to a couple of days. Two areas adjacent to 2008 riprap blanket installations above the road have slumped, partially into the ditch, and have

reduced the ice-holding capacity of the ditch. The 6 inches of topsoil that was supposed to have been placed on the riprap blanket has not happened yet, and the lack of revegetation may have contributed to the slumping.

The Sanctuary Saddle section of the park road is maintained by a grader operator stationed at park headquarters, and the whole section is graded generally at least once every other week during the summer season. A brush-removal crew has worked in the area in past years, and the brush along the road is under control in this section. It is planned that the vegetation on roadside areas would be maintained by using a tractor-mounted mower once the larger growth has been cut or removed.

The Sanctuary Saddle section was widened in the mid-1960s as a precursor to paving, but the paving plans were stopped after a national controversy erupted. The section has had a lifts of new surfacing material through the years, though the shape of the road prism has not changed greatly in 50 years, with some roller coaster effect preserved. The section has long been known for backslope failures, leading to clogged ditches, standing water, and roadbase saturation. Excess ditch material is generally overboarded to the south side of the road during routine grader maintenance actions. The first 750 feet of the project area are at just a 2% slope and keeping water moving in the ditch toward the culvert is challenging. The road in this section does not have a uniform width, though the full length is 24 feet (two lanes) or wider. It is not paved, it has no guardrails, the ditches often do not carry the runoff as efficiently as they could, and slope movement often fills the ditch with water and mud. Some culverts have been lost to being filled with mud and some have been replaced in the last 15 years.

IV. ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

Assumptions for Impact Analysis

This section contains an evaluation of the direct and indirect environmental impacts of one action alternative and the no action alternative. The analysis assumes that the mitigation identified in the *Mitigation and Monitoring* section (page 20) of this environmental assessment would be implemented.

Cumulative impacts were analyzed to add up the incremental impacts to the environment resulting from adding the alternatives to other past, present, and reasonably foreseeable future actions. The cumulative impacts relate primarily to the construction and maintenance of the road itself and continued use of the Sanctuary Saddle section of the park road by park and Kantishna lodge transportation systems as well as by other Kantishna inholders, park researchers, and staff, and by all vehicles and pedestrians in the MP 4.5 area. A Vehicle Management Plan and Environmental Impact Statement was out for public comment this past year, but no final document is presently available.

Alternative 1 – Existing Conditions (No Action)

Vegetation, Wetlands and Soils

No additional vegetation, soils or wetlands would be removed or disturbed to preserve the status quo. Previous road work, including during initial construction, has left drier berms below the road in the Sanctuary Saddle in places where willows and other vegetation grow that are not usually the same vegetation species as those from the surrounding wetter soils. The park mower and brush removal crew removes brush in the ditch, up back slopes, and up to 16 feet down fill slopes. These efforts would continue. Some additional slumping of soils would be likely at MP 4.5 where the soils have slumped since 2008, but routine maintenance actions would remove the material.

Some slumping of soils would be normal along much of the ditchline in the Sanctuary Saddle, where the soils above the road may be riding on a receding permafrost layer and the lubrication of the slope is making the combined soil-vegetation mat gravity-fatigued. Routine maintenance actions have not been wholly effective in keeping up with the slumping and keeping the water in the ditch flowing to culverts. The impacts to vegetation, wetlands and soils from the maintenance work inherent in this alternative would be minor given the tens of thousands of acres of similar vegetation and soils in this area of the park.

Wildlife and Habitat

No additional habitat would be lost for small mammals, birds, and moose. Continued vehicle use of the road would result in a certain amount of local avoidance of the corridor by moose, lynx, bears and other wary animals. This alternative would have a minor impact on wildlife values.

Cultural Resources
No known cultural resources would be affected under this alternative. Routine maintenance of the park road would not adversely affect the historic character and fabric of the park road.

Visitor Use and Recreation
This alternative would not change the visitor use, recreation opportunities, or visitor safety aspects of the park road. The park road at the Sanctuary Saddle meets minimum width standards for two-way traffic on that section of the road and the road at MP 4.5 is a standard two-lane paved road.

Park Management
Under Alternative 1, standard road maintenance actions, such as grading, road gravel replenishment, culvert replacement, roadside brushing, etc., would continue. Roadside brushing has improved in recent years, is almost on a maintainable 3-year cycle, and has improved sight distance in some areas. This alternative would have a minor adverse impact on park management in that the lack of drainage and/or backslope improvements at the Sanctuary Saddle would likely require additional grader time to pull the ditches so that water doesn't continually pool up in the ditch and saturate the nearby roadbed. The toes of the slumping areas at MP 4.5 would need to be removed perhaps annually as they move downhill under gravity and invade the ditch and reduce the size of the ice-holding area.

Cumulative Effects: Approximately 15 acres of vegetation and wildlife habitat has been removed for road construction from this part of the park. The impacts from past, present and reasonably foreseeable human actions on resource values, including vegetation, wildlife habitat and cultural resources, would be moderate and this alternative would contribute minor impacts on resource values. There has been a major beneficial cumulative effect on visitor use and recreation from the initial road construction and this alternative would have a minor adverse impact due to not adding additional interpretive opportunities and safety measures. There has been a major beneficial cumulative effect on park management from the initial road construction and this alternative would have a minor adverse impact due to not following the Road Design Standards. There would not be a contribution to any impacts from other foreseeable local or regional projects.

Conclusion: This alternative includes a minor level of adverse impacts to park management from needing to perform a higher level of road maintenance due to the material slumping down into the ditch at both the Sanctuary Saddle and MP 4.5 areas. Impacts from continuing the status quo to other park resources such as vegetation, wetlands, soils, and wildlife habitat would be minor and the impacts to cultural resources would be negligible.

Alternative 2 – Intensive Rehabilitation of the Park Road in the MP 4.5 and Sanctuary Saddle Areas, (Mile 24.3 – 25.0) (NPS Preferred Alternative)

Vegetation, Wetlands and Soils
Under this alternative approximately 2.3 acres of backslope at MP 4.5 and Sanctuary Saddle would be disturbed to install riprap above the road. Vegetation and upper soil layers were

removed from 1.3 acres slated for riprap blanket treatment in this project during the MP 4.5 project in 2008. This was a woodland mix of white spruce with white spruce-black spruce hybrids and a dense understory of willow, dwarf birch and blueberry. Vegetation at the Sanctuary Saddle would be cut between August 1 and April 1 and the excavation of the backslopes could be done when the ground is frozen or during the summer. The intent of the riprap is to stabilize the slopes so that soils and clumps of vegetation do not annually slump into the road ditch. Due to active revegetation, not all of the impact area associated with riprap blanket installation would be permanently lost. The riprap blanket would be covered with a 6-inch layer of topsoil and reseeded with seeds gathered locally. All of the area disturbed for this project would end up with a low cover of vegetation. Annual mowing in the proposed project area, approximately 16 feet off the road, would keep spruce and shrubs from growing above knee high. The project area would likely initially attract non-native seed establishment in the new topsoil that would require monitoring and eradication by park staff in future years. The limited vegetation removal from this alternative would have a moderate impact on the thousands of acres of similar scrub shrub vegetation resources adjacent to this section of the park road corridor.

The backslope work at MP 4.5 would affect 1.3 acres of wetlands and uplands previously disturbed in 2008 when the vegetation and upper soil layers were removed to create a larger ditch for holding winter ice. No additional vegetation would be removed. Additional soils would be excavated to provide room for the 12 inch thick riprap blanket treatment.

All of the 0.9 acres of vegetation to be removed to install the slope blanket and riprap blanket above the road in the Sanctuary Saddle area are also PFO4/SS1B wetlands. This type of wetland is common locally and regionally and filling 0.9 acres would have a minor effect on the flood retention, habitat and other values received from wetlands in the area. In compliance with NPS wetland protection policies, wetland losses would be compensated for, on a minimum 2:1 basis, in the Kantishna Hills region of the park. Although the impact site and the compensation site have some different functions and values, there would be net gain of wetland area as many of the lost functions, including wildlife habitat, would be replaced at both sites (refer to Appendix A, Wetlands SOF for more details).

Cumulative Effects: Approximately 18 acres of vegetation has been removed for road construction from these two sections of the park. This alternative would increase that loss by 0.9 acres. The impacts from past, present and reasonably foreseeable human actions on vegetation, wetlands and soils would be moderate due to the limited acreage involved and the large undisturbed nearby acreage which provides and protects similar resources and this alternative would contribute moderate impacts to those types of resources. There would not be a contribution to any impacts from other foreseeable local or regional projects.

Conclusion: The clearing of shrubs and other vegetation on 0.9 acres, and the disturbance to soil on 2.2 acres, would result in a moderate adverse impact to vegetation, soils and wetlands. The filling of 0.9 acres of palustrine forested/scrub shrub wetlands for backslope stabilization would result in a moderate net loss of wetlands and wetlands functions in the project area.

Wildlife and Habitat

Wildlife habitat for large mammals, small mammals, and birds would be reduced by 00.9 acres of forest and shrub vegetation for this project. During the construction period noise and human activity would disturb wildlife and cause them to be temporarily displaced from the affected and adjacent areas. The temporary displacement at any one site would likely ebb and flow, from initial vegetation removal progressing to backslope excavation, to riprap placement and to roadway subexcavation and material application. There would be breaks in between the phases where not much is going on at any one site.

No bird nests would be disturbed during the fledging season. Any trees or shrubs above 3 feet in height needed to be removed would be removed between August 1 and May 1, or generally after nesting and fledging has occurred. Shrubs within 5 meters of the road edge are subject to road maintenance activities and are available for removal at any time under an agreement with the U.S. Fish and Wildlife Service. Any occupied nests discovered would be protected at all times. Large mammals, small mammals and birds would find extensive acreage of similar habitat adjacent to the roadside acreage lost for at least one/half mile to the south and for one-half mile to the north in the MP 4.5 area and for ½ mile to the north in the Sanctuary Saddle area.

Cumulative Effects: Approximately 18 acres of wildlife habitat has been removed for road construction from this part of the park. This alternative would increase that loss by 0.9 acres of habitat loss. In the long term, low growing vegetation would return to the soil placed on the riprap and provide some habitat and forage value. Because thousands of acres of similar habitat exist in the vicinity, there has been a moderate cumulative impact on wildlife and habitat in the project area and this alternative would be a moderate contributor to that impact. There would not be a contribution to any impacts from other foreseeable local or regional projects.

Conclusion: The clearing of shrubs, other vegetation, and the disturbance to soil on 2.2 acres would result in a moderate adverse impact to wildlife habitat. The incremental impact from this project to wildlife and habitat would add to the total habitat loss in the project area.

Cultural Resources

The park road in the Sanctuary Saddle area retains some of the flavor of a rustic road, though the work to prepare it for widening in the 1960s took it from a one lane road with pullouts to a two lane road. The improvements proposed in this alternative would retain the existing width, or even narrow some of the sections that exceed maximum width standards, in the project, and would not change the surfacing material. The project would apply an 8 inch wear layer and standardize a crown at a minimum of 3%, alter some relatively flat crowns areas on gentle curves into superelevations and would make some drainage improvements. Routine grading after the project is completed would help make the surface look of the road appear similar to the look of the past twenty years. Almost all of the culverts would be resized to fit standards. The riprap installed above the road would keep the slope from falling into the ditch. Construction limits would be established along the whole project length to help prevent damage to areas not being worked on.

These improvements should have the effect of making the road less in need of heavy maintenance, which could help it retain its rustic and historic nature. There would, however, be

a permanent minor adverse effect to the historic park road from upgrades to the visible road structure, such as smoothing the vertical alignment.

The MP 4.5 project area is along a paved section of the road, and engineered structures are normal to improve drainage and to protect the road. The additional riprap sections would detract from any rustic nature left in this section of the road until covered by soil and revegetation. The riprap slopes would need to be mowed so that tree roots do not have a change to either disrupt the fabric under the riprap or grow but produce trees unstable in such a thin soil layer. The mowing could remove some of the landscape closeness that accompanies the rest of the road.

The park Section 106 coordinator would determine whether the project can be reviewed under the Systemwide Programmatic Agreement or if formal SHPO consultation is needed to address direct and indirect effects. Should presently unidentified cultural resources be discovered during the project, the work will stop and the superintendent and Section 106 Coordinator will be notified immediately.

Cumulative Effects: All known archeological sites in the project area will be avoided and will not be impacted. The cumulative impact to the park road from past, present and known future actions is minor and this alternative would contribute a minor impact to the rustic appearance of the road.

Conclusion: The park road may be the only cultural resource that would be impacted by the project. There should be a beneficial impact to the rustic nature of the park road by improving drainage features and narrowing the road in sections of the Sanctuary Saddle where it exceeds width standards. Short changes to vertical alignment (cutting one bump) would create a minor impact to the rustic nature of the road.

Visitor Use and Recreation

There would be a temporary impact to recreational opportunities for visitors driving or walking the pavement in the 4.5 mile area and for visitors to the Teklanika Campground and visitors on the bus systems. Material hauling would generally come from outside the park but could also occur to and from the Teklanika Pit for reject and other materials. The impacts would extend for one season. Vehicles and visitors would still use the road while it is under construction but there would likely be short delays while travelling through the sections of road under repair.

Although the road has some level of constant activity in summer from vehicles, the adjacent forest and tundra is relatively quiet. The noise and visibility of construction activities would negatively affect backcountry users in the areas next to the road. However, since backcountry camping is required to happen at least ½ mile away from and out of sight of the park road, most of the camping experience would be unaffected by the project. The day hikers and bicyclists using these segments of road would be the most affected visitors since their activities are most closely tied to the road corridor. Wildlife watching and bird watching from the road would be adversely affected by the temporary wildlife displacement due to the construction noise and activity. The day hiking opportunities in these areas would be negatively affected by construction noise over most of the summer.

Some of the Sanctuary Saddle work would be within the hearing distance of campers at the Sanctuary Campground. Those projects would negatively affect the experience at the campground, but the land contours would block most of the noise from the construction.

The newly constructed backslopes would look raw for many years, reminding visitors of the changes.

Cumulative Effects: Noise and commotion from bus and other vehicle use on the road would diminish the quality of the experience for users of these sections of the park who are seeking an experience of the landscape uninterrupted by human actions. The park road is currently plowed on one lane to MP 4.5 throughout the winter to manage the ice buildup around or over the road, and that vehicle use, noise, and snow manipulation can degrade wilderness character during the winter. The park road in the Sanctuary Saddle is generally not used in winter over other logical routes through the landscape and has a negligible impact during those seasons. There would be a permanent minor adverse effect to the visitor experience from the perception that the upgrades to the visible road structure signify some compromise of rustic/historic character. A proposal to plow the road in winter to MP 12 will be presented to the public later this year and could affect recreational use in this section of the park.

Initial road construction and past use present the foundation of almost all summer park use in this section of the park and, on balance, are seen as having a major beneficial set of impacts to visitor use and recreation. This alternative would be responsible for a minor beneficial impact by improving road drainage and adding structures, eventually almost unseen, that could help stabilize the slopes above the road.

Conclusion: The actions proposed in this alternative would have a temporary moderate negative effect on visitor experience due primarily to the construction activity for a couple of months along two short sections of roadway, large number of gravel trucks moving between the entrance and the project area, and additional trucks moving material to and from the Teklanika Pit. There would be a permanent minor adverse effect to the visitor experience of some from the perception that the new engineering structures placed above the road at MP 4.5 and Sanctuary Saddle signify some loss of rustic/historic character.

Park Management

This alternative would have a minor beneficial impact on park management. Park management anticipates that the rest of the backslope above this road section that was not given riprap treatment in 2008 is prone to failure, based on the two slumps since then. The post-2008 slumps at MP 4.5 need to be removed so that they do not lessen the ice-holding capacity of the ditch, and it would be efficient to treat the rest of the slopes while there is a similar project going on at the Sanctuary Saddle. The backslope above the road at the Sanctuary Saddle presents a maintenance problem, in that muddy water weeping into the ditch tends to create pockets of mud which blocks water flow in the ditch. The overboarding of mud can be common during rain events, which can be accompanied by roadbed saturation. While the roadbed has not failed in recent years, the possibility cannot be dismissed under these conditions.

Cumulative Effects: Past construction of the park road and the present continuing use of the road are the main human actions that have affected the management of this landscape. All of these actions are considered of major benefit to park management. The road has allowed manageable access through a large wilderness area for millions of visitors who would otherwise only have a vicarious experience with the landscapes and daily activities of the wildlife of interior Alaska.

Conclusion: This alternative would have a minor beneficial impact on park management by adding structures above the road that would reduce the expenditures on summer maintenance of the park road. This alternative would attempt to eliminate slumping into the road ditch, both at MP 4.5 and at the Sanctuary Saddle, and to eliminate more than routine maintenance of the road ditch in the Sanctuary Saddle area.

Alternative 3 – Rehabilitation of the Park Road in the MP 4.5 and Sanctuary Saddle Areas, (Mile 24.3 – 25.0)

Vegetation, Wetlands and Soils

Under this alternative no backslope vegetation would be removed to install riprap above the road. The underdrain installation and other road prism work at the Sanctuary Saddle would be done in presently disturbed areas of the road structure footprint. The drainage windows would be cleaned of invasive vegetation and mud to allow water delivered to the downhill side of the road to be carried away from the road prism toward the wetland communities below the road.

Cumulative Effects: Approximately 18 acres of vegetation has been removed for road construction from these two sections of the park. This alternative would not increase that loss. The impacts from past, present and reasonably foreseeable human actions on vegetation, wetlands and soils would be moderate due to the limited acreage involved and the large undisturbed nearby acreage which provides and protects similar resources and this alternative would contribute negligible impacts to those types of resources. There would not be a contribution to any impacts from other foreseeable local or regional projects.

Conclusion: The clearing of vegetation in the drainage windows below the road and the disturbance to soils within the road structure footprint would result in a negligible adverse impact to vegetation, soils and wetlands.

Wildlife and Habitat

Wildlife habitat for large mammals, small mammals, and birds would not be reduced by this project. During the construction period noise and human activity would disturb wildlife and cause them to be temporarily displaced from the affected and adjacent areas. The temporary displacement at any one site would likely ebb and flow, from excavation for the underdrain during the spring to road subexcavation, culvert replacement, and wear layer placement during the summer. There could be breaks in between the phases where not much is going on at any one site.

No bird nests would be disturbed during the fledging season. Any vegetation invading the drainage windows above 3 feet in height would be removed between August 1 and April 1, or generally after nesting and fledging has occurred. Shrubs within 5 meters of the road edge are

subject to road maintenance activities and are available for removal at any time under an agreement with the U.S. Fish and Wildlife Service. Any occupied nests discovered would be protected at all times. Small mammals and birds, and possibly large mammals, would utilize the revegetated area on the riprap of the 2008 project once the new soil stabilizes.

Cumulative Effects: Approximately 18 acres of wildlife habitat has been removed for road construction from this part of the park. This alternative would not increase that habitat loss. In the long term, low growing vegetation would return to the soil placed on the riprap of the 2008 project and provide some habitat and forage value. Because thousands of acres of similar habitat exist in the vicinity, there has been a moderate cumulative impact on wildlife and habitat in the project area and this alternative would be a negligible contributor to that impact. There would not be a contribution to any impacts from other foreseeable local or regional projects.

Conclusion: The clearing of vegetation in the drainage windows below the road and the establishment of soil and vegetation in the long term on the 1.2 acres of the 2008 project riprap would result in a minor beneficial impact to vegetation and soils and would result in a negligible impact to wetlands.

Cultural Resources

The park road in the Sanctuary Saddle area retains some of the flavor of a rustic road, though the work to prepare it for widening in the 1960s took it from a one lane road with pullouts to a two lane road. The improvements proposed in this alternative would retain the existing width, or even narrow some of the sections that exceed maximum width standards, in the project, and would not change the surfacing material. The project would apply an 8 inch wear layer and standardize a crown at a minimum of 3%, alter some relatively flat crowns areas on gentle curves into superelevations and would make significant drainage improvements. Routine grading after the project is completed would help make the surface look of the road appear similar to the look of the past twenty years. All of the culverts would be resized to fit standards. Construction limits would be established along the whole project length to help prevent damage to areas not being worked on.

These improvements would lessen the need to dig out soft or saturated material in the road prism because much subsurface water would be drained away by the underdrain structure. The ditch would continue to commonly have material slough or slump into it from the wet backslope above, but the reconditioned ditch would be more maintainable with standard grading techniques. This limited level of improvement would help the park road retain its rustic and historic nature. There would, however, be a permanent minor adverse effect to the historic park road from upgrades to the visible road structure, such as smoothing the vertical alignment and standardizing some crowned areas on corners into superelevated areas.

The MP 4.5 project area is along a paved section of the road, and engineered structures are normal to improve drainage and to protect the road. Areas of backslope presently bare would be reshaped as necessary (slumps removed) and revegetated. The riprap sections from the 2008 project detract from any rustic nature left in this section of the road until covered by soil and revegetation. The riprap slopes would need to be mowed so that tree roots do not have a change to either disrupt the fabric under the riprap or grow but produce trees unstable in such a thin soil

layer. The mowing could remove some of the landscape closeness that accompanies the rest of the road.

The park Section 106 coordinator would recommend whether the project can be reviewed under the Systemwide Programmatic Agreement or if formal SHPO consultation is needed. Should presently unidentified cultural resources be discovered during the project, the superintendent and Section 106 coordinator would be notified immediately.

Cumulative Effects: All known archeological sites in the project area will be avoided and will not be impacted. The cumulative impact to the park road from past, present and known future actions is minor and this alternative would contribute a minor impact to the rustic appearance of the road.

Conclusion:
The park road is the only cultural resource that would be impacted by this alternative. It is anticipated that any adverse effects will be avoided. There should be a beneficial impact to the rustic nature of the park road by improving drainage features and narrowing the road in sections of the Sanctuary Saddle where it exceeds width standards. Short changes to vertical alignment (cutting one bump) would create a minor impact to the rustic nature of the road.

Visitor Use and Recreation
There would be a temporary impact to recreational opportunities for visitors driving or walking the pavement in the 4.5 mile area and for visitors to the Teklanika Campground and visitors on the bus systems. Material hauling would generally come from outside the park but could also occur to and from the Teklanika Pit for reject and other materials. The impacts would extend for one season. Vehicles and visitors would still use the road while it is under construction but there would likely be short delays while travelling through the sections of road under repair.

Although the road has some level of constant activity in summer from vehicles, the adjacent forest and tundra is relatively quiet. The noise and visibility of construction activities would negatively affect backcountry users in the areas next to the road. However, since backcountry camping is required to happen at least ½ mile away from and out of sight of the park road, most of the camping experience would be unaffected by the project. The day hikers and bicyclists using these segments of road would be the most affected visitors since their activities are most closely tied to the road corridor. Wildlife watching and bird watching from the road would be adversely affected by the temporary wildlife displacement due to the construction noise and activity. The day hiking opportunities in these areas would be negatively affected by construction noise over most of the summer.

Some of the Sanctuary Saddle work would be within the hearing distance of campers at the Sanctuary Campground. Those projects would negatively affect the experience at the campground, but the land contours would block most of the noise from the construction.

The backslope work at MP 4.5 would look raw for many years, reminding visitors of the changes.

Cumulative Effects: Noise and commotion from bus and other vehicle use on the road would diminish the quality of the experience for users of these sections of the park who are seeking an experience of the landscape uninterrupted by human actions. The park road is currently plowed on one lane to MP 4.5 throughout the winter to manage the ice buildup around or over the road, and that vehicle use, noise, and snow manipulation can degrade wilderness character during the winter. The park road in the Sanctuary Saddle is generally not used in winter over other logical routes through the landscape and has a negligible impact during those seasons. There would be a minor beneficial effect to the visitor experience from the perception that the upgrades to the MP 4.5 backslope would remove some engineered structures from view. A proposal to plow the road in winter to MP 12 will be presented to the public later this year and could affect recreational use in this section of the park.

Initial road construction and past use present the foundation of almost all summer park use in this section of the park and, on balance, are seen as having a major beneficial set of impacts to visitor use and recreation. This alternative would be responsible for a minor beneficial impact by improving road drainage and masking presently uncovered engineered structures

Conclusion: The actions proposed in this alternative would have a temporary moderate negative effect on visitor experience due primarily to the construction activity for a couple of months along two short sections of roadway, a large number of gravel trucks moving between the entrance and the project area, and additional trucks moving material to and from the Teklanika Pit. There would be a permanent minor beneficial effect to the visitor experience of some from the perception that covering the new engineering structures placed above the road in 2008 at MP 4.5 would signify a gain of rustic/historic character.

Park Management

This alternative would have a minor adverse impact on park management. At MP 4.5, park management anticipates that the rest of the backslope above this road section that was not given riprap treatment in 2008 is prone to failure, based on the two slumps since then. The post-2008 slumps at MP 4.5 need to be removed so that they do not lessen the ice-holding capacity of the ditch, and any similar slumps in the future would also need to be removed to retain the ice-holding capacity of the ditch.

The backslope above the road at the Sanctuary Saddle presents a maintenance problem, in that the hillslope has enough water in the soil to lubricate it and cause it to slide downslope, seemingly only held in place by vegetation. The muddy water that weeps into the ditch tends to create pockets of mud which blocks water flow in the ditch. The greater the mud flow, the greater the chance that a culvert would get plugged. It can be very difficult to re-open a plugged culvert once material has packed and solidified within it. The requirement of maintenance staff to get rid of the mud by overboarding can be common during rain events. This alternative would add culverts and reshape the ditches so that there would be a greater chance for water in the ditch to flow to a culvert and not puddle up, but would not attempt to eliminate the downslope movement of the hillside above the road. Additional maintenance of the ditch and culverts would be required under this alternative than would be likely under alternative 2.

Cumulative Effects: Past construction of the park road and the present continuing use of the road are the main human actions that have affected the management of this landscape. All of these actions are considered of major benefit to park management. The road has allowed manageable access through a large wilderness area for millions of visitors who would otherwise only have a vicarious experience with the landscapes and daily activities of the wildlife of interior Alaska.

Conclusion: This alternative would have a minor adverse impact on park management by continuing the requirement to maintain the Sanctuary Saddle ditch more often than other roadside ditches, and to react after the fact to additional slumping in the MP 4.5 area instead of adding structures above the road that could preclude slumping. This alternative would likely require the park to spend more money on road maintenance than alternative 2.

V. CONSULTATION AND COORDINATION

List of Persons and Agencies Consulted:

Don Rice, Unit Leader, Regulatory Branch, Alaska District, U.S. Army Corps of Engineers, Anchorage, AK
Ted Swem, U.S. Fish and Wildlife Service, Endangered Species Coordinator, Ecological Services Office, Fairbanks, AK
Betty Chon, Project Manager, Western Design Center, Federal Highways Administration
Malcolm Ulrich, Geologist, Western Design Center, Federal Highways Administration
Tim Taylor, East District Road Foreman, Denali National Park and Preserve
Phoebe Gilbert, Archeologist, Denali National Park and Preserve

List of Preparers:

Steve Carwile, Compliance Program Manager, Denali National Park and Preserve
Jon Paynter, GIS Specialist, Denali National Park and Preserve

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APPENDIX A

SUBSISTENCE - SECTION 810(a) OF ANILCA
SUMMARY EVALUATION AND FINDINGS

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence activities that could result from the rehabilitation of the MP 4.5 and MP 24 areas of the park road in Denali National Park and Preserve.

II. THE EVALUATION PROCESS

Section 810(a) of ANILCA states:

> "In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -
>
> (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;
>
> (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and
>
> (3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the National Park System in Alaska. Denali National Park and Preserve was created by ANILCA Section 202(3)(a):

> "The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of, fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves,

swans and other waterfowl; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities."

ANILCA Section 202(3) also states: "Subsistence uses by local residents shall be permitted in the additions to the park where such uses are traditional in accordance with the provisions in title VIII."

Title I of ANILCA established national parks for the following purposes:

> ". . . to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.
>
> ". . . consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."

The potential for significant restriction must be evaluated for the proposed action's effect upon ". . . subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use. . . ." (Section 810(a))

III. PROPOSED ACTION ON FEDERAL LANDS

Alternatives 1, 2 and 3 are described in detail in the environmental assessment. Customary and traditional subsistence use on NPS lands will continue as authorized by federal law under all alternatives. Federal regulations implement a subsistence priority for rural residents of Alaska under Title VIII of ANILCA.

The NPS proposes to rehabilitate the park road by adding backslope stabilization structures to the MP 4.5 area and the MP 24 area along the paved and gravel sections respectively of the park road. The sites are in the former Mount McKinley National Park wherein subsistence activities are not allowed.

IV. AFFECTED ENVIRONMENT

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA allows local residents to engage in subsistence uses in the ANILCA additions to the park where such uses are traditional in accordance with the provisions in Title VIII. Lands within former Mount McKinley National Park are closed to subsistence uses.

A regional population of approximately 300 eligible local rural residents qualifies for subsistence use of park resources. Resident zone communities for Denali National Park are Cantwell, Minchumina, Nikolai, and Telida. By virtue of their residence, local rural residents of these communities are eligible to pursue subsistence activities in the new park additions. Local rural residents who do not live in the designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park additions, may continue to do so pursuant to a subsistence permit issued by the Park Superintendent.

The NPS realizes that Denali National Park and Preserve may be especially important to certain communities and households in the area for subsistence purposes. The resident zone communities of Minchumina (population 22) and Telida (population 11) use park and preserve lands for trapping and occasional moose hunting along area rivers. Nikolai (population 122) is a growing community and has used park resources in the past. Cantwell (population 147) is the largest resident zone community for Denali National Park and Preserve, and local residents hunt moose and caribou, trap, and harvest firewood and other subsistence resources in the new park area.

The main subsistence species, by edible weight, are moose, caribou, furbearers, and fish. Varieties of subsistence fish include coho, king, pink and sockeye salmon. Burbot, dolly varden, grayling, lake trout, northern pike, rainbow trout and whitefish are also among the variety of fish used by local people. Beaver, coyote, land otter, weasel, lynx, marten, mink, muskrat, red fox, wolf and wolverine are important furbearer resources. Rock and willow ptarmigan, grouse, ducks and geese are important subsistence wildlife resources.

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in any given year many vary considerably from previous years because of such factors as weather, migration patterns and natural population cycles. However, the pattern is assumed to be generally applicable to harvests in recent years with variations of reasonable magnitude.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
- the effect the action might have on subsistence fishing or hunting access; and
- the potential to increase fishing or hunting competition for subsistence resources.

The potential to reduce populations:

Provisions of ANILCA and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

Construction and use of pullouts and other improvements to the western end of the Denali Park Road would have a long-term but minor impact on wildlife habitat and populations. The alternatives would not adversely affect the distribution or migration patterns of subsistence resources. Therefore, no change in the availability of subsistence resources is anticipated as a result of the implementation of this proposed action.

Restriction of Access:

Section 811 of ANILCA addresses "Access" for subsistence as follows: "The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands." Traditional access for Title VIII subsistence uses should not be significantly restricted under the proposed action.

Alternative 1 (No Action), the status quo, and Alternative 2 (Proposed Action), are not anticipated to significantly limit or restrict the access to subsistence uses within the ANILCA additions of Denali National Park or Denali National Preserve. Federal and State regulations assure the continued viability of fish and wildlife populations.

Increase in Competition:

Alternative 1 (No-Action), maintaining the status quo and Alternative 2 (Proposed Action) are not expected to result in increased competition for fish, wildlife or other resources that would significantly impact subsistence users in Denali National Park and Preserve. Federal and State regulations assure the continued viability of particular fish or wildlife populations

VI. AVAILABILITY OF OTHER LANDS

The preferred alternative is consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act.

VII. ALTERNATIVES CONSIDERED

The alternatives considered for this project were limited to the lands along the park road. The alternatives are: 1) continue the existing conditions (No Action) which includes annual maintenance

of the park road by snow removal operations, grading the gravel surface, culvert cleaning, ditch management, vegetation brushing and small repairs; 2) adding 8 inches of wear-surface gravel on 1/2 mile of the road section at MP 24, replacing culverts and improving drainage, and adding about 1,000 linear feet of riprap backslope structures to the road backslopes in each of the MP 4.5 and Mp 24 areas; and 3) adding 8 inches of wear-surface gravel on 1/2 mile of the road section at MP 24, replacing culverts and improving drainage and installing up to 2,300 linear feet of underdrain under the ditch in the MP 24 area, and finish covering the riprap backslopes at MP 4.5 with topsoil and native seeds.

VIII. FINDINGS

This evaluation concludes that the preferred alternative would not result in a significant restriction of subsistence uses within Denali National Park and Preserve.

APPENDIX B: STATEMENT OF FINDINGS

STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS)

SANCTUARY SADDLE AND MP4.5
DENALI NATIONAL PARK AND PRESERVE, ALASKA

June 2012

Recommended:

_____

Superintendent, Denali National Park and Preserve Date

Certified for Technical Accuracy and Servicewide Consistency:

_____

Chief, Water Resources Division, Washington Office Date

Approved:

_____

Regional Director, Alaska Region Date

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) has prepared and made available for public review an environmental assessment (EA) to evaluate the impacts of road rehabilitation at MP 4.5 and MP 24 (Sanctuary Saddle) of the Denali National Park Road (park road) in Denali National Park and Preserve (the park).
The NPS is proposing to:

- Install 1256 linear feet of riprap blanket above the road in the MP 4.5 area to prevent the backslope from slumping into the ditch above the road constructed to hold winter ice
- Install 1444 linear feet of riprap blanket above the road to prevent the backslope from sliding into the roadside ditch, adding an 8 inch wear layer to 2,300 feet of park road, replace all culverts, and reshape the road in the Sanctuary Saddle area.

The proposed project is consistent with similar projects and management plans outlined in both the 1986 General Management Plan and the 1997 Development Concept Plan/Environmental Impact Statement, which was an amendment to the 1986 plan.

Executive Order (E.O.) 11990, Protection of Wetlands, requires the NPS, and other federal agencies, to evaluate the likely impacts of actions in wetlands. The E.O. requires that short- and long-term adverse impacts associated with occupancy, modification or destruction of wetlands be avoided whenever possible. Indirect support of development and new construction in such areas should also be avoided wherever there is a practicable alternative.

To comply with these orders, the NPS has developed a set of agency policies and procedures which can be found in Director's Order (DO) 77-1, Wetland Protection, and Procedural Manual 77-1, Wetland Protection. The policies and procedures related to wetlands emphasize: exploring all practical alternatives to building on, or otherwise affecting, wetlands; reducing impacts to wetlands whenever possible; and providing direct compensation for any unavoidable wetland impact by restoring degraded or destroyed wetlands on other NPS properties.

The purpose of this Statement of Findings (SOF) is to present the NPS rationale for its proposed road rehabilitation at MP 4.5 and Sanctuary Saddle in the wetland area. This SOF also documents the anticipated effects on these resources.

WETLANDS WITHIN THE PROJECT AREA

Wetland boundaries were identified in the field by NPS personnel in August 2006, transcribed onto air photos, and converted to a geographic information system (GIS) layer to determine wetland acreage. Of the approximately 2.2 acres that would be disturbed by the proposed action, 1.5 acres is classified as wetlands under the "Classification of Wetlands and Deepwater Habitats of the United States," the Cowardin Classification System (Cowardin et al. 1979), and are therefore subject to NPS wetlands compliance procedures. However, the MP 4.5 project consists of work to place additional riprap blankets on 0.6 acres of wetlands (and 0.7 acres of upland) where the vegetation and upper soil layers were removed in 2008 as part of an approved project to create a larger ditch for holding ice during the winter. The loss of those wetlands areas resulted in a compensation project in the Glen Creek area of the Kantishna Hills in the western part of the park. The new

disturbance for this project would be the 0.9 acres of wetlands above the park road in the Sanctuary Saddle area.

The 0.9 acres of wetlands newly disturbed for this project are classified as palustrine forested/scrub-shrub, needle-leaved evergreen, saturated wetlands (PFO4/SS1B). Vegetation in palustrine forested/scrub-shrub wetlands is typically dominated by black spruce/white spruce hybrids (Viereck et al. 1992). The understory shrub layer can vary slightly, but typically consists of both low and tall shrubs of willow (including *Salix planifolia*), Labrador tea (*Ledum* spp.), lowbush cranberry (*Vaccinium vitis-idaea*), and bog blueberry (*Vaccinium uliginosum*). Common ground cover includes peat mosses (*Sphagnum* spp.) and herbaceous species like field horsetail (*Equisetum arvense*) and few flowered sedge (*Carex pauciflora*) and a variety of forbs (Viereck at al. 1992; Reed 1996).

These affected wetlands function to attenuate snow melt surface flow during spring break-up, when the ground is still frozen. They also function to slow water movement during heavy rainfall events and limit erosion of soils during those events and help protect the park road from flood events. The wetlands involved here also include ground water discharge points (springs) that help keep the lower slopes saturated; however, they contribute to lubricating the soils enough in the Sanctuary Saddle area that the slopes commonly drop into or weep into and fill the ditch. These wetlands also provide habitat for wildlife, such as red squirrels, snowshoe hares, porcupine, and common bird species such as gray jays, thrushes, sparrows, and warblers. Less common raptors such as hawk-owls use wetland trees for nesting. Moose frequent the area for forage. No threatened or endangered animal or plant species are found in the area and no research or reference sites have been developed in the project area.

There are no water wells located near the project area. Flooding at this site has not been documented, as forests and open wetlands cover most of the adjacent land and gravelly subsurface soils absorb the rainfall.

THE PROPOSAL IN RELATION TO WETLANDS

The proposal and alternatives are described in detail in the project EA.

The road rehabilitation at MP 4.5 and the Sanctuary Saddle would newly impact a maximum of 0.9 acre of palustrine forested/scrub-shrub (PFO4/SS1B). The extent of disturbance is shown on Figures 2 and 3 of this EA. The majority of the wetland disturbance would be caused by placing riprap blankets as backslope to keep the ditches from clogging or getting blocked by slumping soil.

Palustrine forested/scrub-shrub, needle-leaved evergreen/broad-leaved deciduous, saturated wetlands (PFO4/SS1B), as described above, are common throughout the eastern areas of the park. The wetlands located at the proposed project site are a relatively small part of the park's wetlands and are locally common: over 1,000 acres of palustrine forested/scrub-shrub wetlands are present above the road in the Sanctuary Saddle area. Therefore, the approximately 0.9 acre of palustrine forested/scrub-shrub wetlands that would be lost by the proposed action equates to less than 0.1 percent of the total palustrine forested/scrub shrub wetland acreage in just these areas of the park. Removal of this amount of wetlands would have a moderate impact on overall wetland functions

and values, such as surface water quality (including sediment control and water purification), floodwater attenuation, and animal habitat.

The primary purposes of this project are to protect improvements made to the road at MP 4.5 in 2008 that greatly reduced the winter aufeis accumulation on the park road. The 2008 project was designed to provide sufficient ditch capacity to retain winter ice in the upgradient ditch so that park personnel would not have to dig up the ice and dispose of it to the downgradient side of the road; an act which crushes vegetation. The MP 4.5 project would continue that work to stabilize the backslope and protect the ice-holding capacity of the ditch. The work at the Sanctuary Saddle would utilize similar backslope stabilization structures to try to keep mud and soil/vegetation clumps from sliding into the ditch and blocking road drainage. Also, activities associated with the proposed project (ditch reconditioning, drainage window cleaning, underdrain installation, and replacement of culverts) would result in the beneficial impact of increased hydrological connectivity between vegetation upgradient and downgradient from the road in the Sanctuary Saddle. The rock blankets to be installed above the road would allow water flow to the road ditch, but would prevent soil slumping.

The proposed project area wetland soils include up to 60 inches of organic peat soils over gravelly glacial till. The installation of culverts and ditch, and related road improvements would be accomplished by removing the organic soils and replacing them with a 12-30 inch thick riprap blankets, some on which would have 4 inches of foam underneath to lessen warming of the permafrost below.

Discharge of dredged or fill material into jurisdictional wetlands is regulated by the U.S. Army Corps of Engineers (USACE) under section (§) 404 of the Clean Water Act. The project would need a §404 permit from USACE for the placing of 1.5 acres of riprap into wetlands.

MITIGATION PROPOSED

Federal and NPS policy is to avoid locating projects in wetlands whenever possible. If circumstances make it impracticable to avoid wetlands, then mitigation of unavoidable impacts must be planned. An NPS wetlands no-net-loss policy requires that wetland losses be compensated for by restoration of wetlands, preferably of comparable wetland type and function and in the same watershed if possible.

Of the 2.2 acres potentially affected by the proposed action, 0.9 acres is classified as wetlands. This SOF commits to full 2:1 compensation for the 0.9 acre of disturbed wetlands.

<u>On-Site Rehabilitation</u>
As much as possible, disturbance of wetlands in and around the project area would be avoided. Silt fences would be set up to define construction impact limits. Pads would be used for heavy equipment working on the drainage windows. Any areas indirectly disturbed by construction activities would be restored to as near natural conditions as possible by reestablishing contours through raking or by small equipment and salvaged tundra mats would be saved for damaged areas. Fugitive dust from construction activities would be mitigated through the use of dust abatement practices (i.e., watering). Prior to the start of construction activities, the NPS would salvage as much

topsoil, organic matter, and vegetation as necessary for later use in site revegetation or for use in revegetating other local sites. Salvaged material would be stockpiled separately and would be placed in the disturbed areas following construction.

Off-Site Compensation (Wetland Restoration)

Compensation, by restoration of previously disturbed degraded wetlands, is required under the NPS no-net-loss policy for projects involving disturbance or loss of wetlands. Compensation will occur for the loss of 0.9 acres of palustrine wetland. Two-for-one compensation would be completed within the park, rather than 1:1, because the work at the compensation site would restore some, but not all of the natural functioning of the riparian wetlands previously lost at the site. Stabilizing the channel and floodplain would allow processes such as natural revegetation, soil deposition from spring breakup events, and pool and riffle initiation to begin with a much smaller chance of channel blowout during flooding and resultant loss of functioning.

A Federal Highways Administration funded project to remove gravel from former placer mined areas in Kantishna is scheduled for 2013-2015. Three acres within the park's Eldorado Creek floodplain has been selected for restoration within the scope of this mitigation. The project site and the Kantishna compensation site (see Figure B-1) are separated by up to 65 miles but are both within Denali National Park. The affected area and the proposed compensation site have some different wetland functions and values. The compensation area wetlands are presently classified as Riverine Upper Perennial Unconsolidated Shore with Intermittent Flooding (R3USJ), and Palustrine Unconsolidated Shore Cobble Gravel Seasonally Flooded/Well-Drained (PUS1D). Restoration plans include removing and disposing of debris; stabilizing the channel and floodplain; stabilizing the access road; and revegetating the stripped areas. Preliminary work includes water and soil sampling, and engineering surveys of the existing stream channel, floodplains, and upland topography. Discharge measurements will be collected to aid in stream channel design. Soil sampling will assess the geo-chemistry of the upper watershed, and determine the soil's potential for revegetation efforts. Surveys, both cross-sectional and topographical, will be conducted to supplement site data on the NPS topographic maps. This information will be used to locate and estimate material amounts for use in recontouring the site and reconstructing the stream channel and floodplain.

Cost estimates for this project are approximately $25,000 per acre, based on an unpublished report, "Cost Estimation for Reclamation, National Park Service, Alaska Regional Office, January 1994." This report reviewed three separate mining reclamation projects that were conducted on abandoned claims in Denali National Park and Preserve. The cost associated with compensation for the proposed road project would be about $45,000. The park cannot use funds specifically earmarked for natural resources management (e.g., Natural Resources Preservation Program funding, Water Resources Division-Competitive, etc.) to compensate for construction impacts.

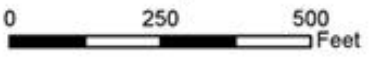
Stream channel and floodplain restoration will be based on the techniques of the Glen Creek restoration project at Denali. Project design requirements will include a channel capacity for a 1.5-year (bankfull) discharge and a floodplain capacity for up to a 100-year discharge. The project design will include the use of bio-revetment, located on meanders, to encourage channel stabilization using natural methods. Brush bars, located in areas of little or no fines, will be employed to dissipate floodwater energy and encourage sediment deposition. Riparian areas will be

Figure B-1 Wetlands Compensation Site

Wetlands Compensation Area Location - Eldorado Creek, Kantishna, Denali National Park and Preserve. 1.8 acres

Image Date: August 2011

Denali NP and Preserve



revegetated with willow cuttings and other appropriate vegetation. Depending on the results from the soils nutrient analysis, fertilizer will be used to ensure a quick start for new vegetation.

Monitoring of the stream channel and riparian areas will occur to determine the success of the reclamation efforts. Vegetation plots and permanently mounted cross-sections will be surveyed and measured again after the first year. Additional seeding and revegetation will occur on areas not vegetated during the first year. It is anticipated that the site will be a functional wetland within 3-5 years, and will be fully-functioning within 15 years.

ALTERNATIVES CONSIDERED

Alternative 1 describes the No Action Alternative; under this alternative, the NPS and Federal Highways Administration would not complete the proposed road rehabilitation. Existing use and maintenance of the road at MP 4.5 and at the Sanctuary Saddle would continue. Refer to Chapter 2 of the EA for a more detailed explanation of Alternative 1.

Alternative 2 is the NPS Preferred Alternative to install additional backslope riprap blankets at MP 4.5 and at the Sanctuary Saddle. The 2008 project at MP 4.5 included seven areas of riprap blanket and this alternative would fill in all the areas between these sections with additional riprap blanket so that none of the slope above the ditch designed for significant winter ice-holding capacity gets filled by slumping material. The project at the Sanctuary Saddle would include installing slope blanket and rock buttress sections above the road, constructing standard underdrains, performing ditch reconditioning, replacing culverts, cleaning drainage windows, providing some short grade raises, placing an 8 inch lift of surface wear material, and adjusting the road width to meet standards. The riprap work there would be an attempt to keep the hillside from incrementally sliding into the road ditch. Under this alternative about 0.9 acres of PFO4/SS1B wetlands would be removed.

Alternative 3, is the Environmentally Preferred Alternative and would finish the 2008 project at MP 4.5 by adding 6 inches of topsoil, insuring native vegetation starts on the whole area backslope, and cleaning out area that have slumped since 2008. The project at the Sanctuary Saddle would include constructing a standard underdrain the full length of the 2,300 foot long project, performing ditch reconditioning, replacing culverts, cleaning drainage windows, providing some short grade raises, placing an 8 inch lift of surface wear material, and adjusting the road width to meet standards. No wetlands that weren't disturbed by the 2008 projectwould be impacted under this alternative.

Alternative 1, the No Action Alternative, would not accomplish the purpose or relieve the need for the project. This alternative allows the continuation of unvegetated slopes above the road at MP 4.5 and possible additional slumping of the backslope into the ditch. The alternative does not improve drainage conditions at the Sanctuary Saddle. No wetlands would be disturbed by this alternative.

The reason for selecting Alternative 2, with a greater wetland impact, is that it is a proactive approach to potentially serious maintenance conditions. Slumping of the backslope at MP 4.5 can

cause the ditch to hold less ice, which would put more ice on the road and would require more time to remove the ice during Spring road opening. Slumping of the backslope in the Sanctuary Saddle tends to fill the ditch with mud, which can cause water to continually stand in the ditch and saturate the road prism. The ditch mud can also clog culverts or completely block the ditch, cause water to run across the gravel road, putting the road at risk.

Alternative 3 would make limited improvements to the backslope at MP 4.5, with over half of the area remaining without riprap blankets classified as uplands before the 2008 backslope work and therefore less prone to slumping. This alternative would also make limited improvements to the road at the Sanctuary Saddle. The underdrain would help to drain away subsurface water and additional culverts would intercept additional surface water in the ditch. The park would probably need to spend more time on maintenance of the ditch, including reshaping the ditch during slumping events so that surface water continues to run toward the culverts.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES ASSOCIATED WITH THE PROPOSED ACTION

The potential environmental consequences of the proposed action and alternatives are fully described in the EA.

CONCLUSION

The NPS concludes that the best alternative for long-term protection of the road function and structure would include disturbing about 0.9 acre of wetlands while installing riprap blankets above the road for road and roadside ditch protection. Wetlands would be avoided to the maximum extent practicable. The wetland impacts that could not be avoided would be minimized. The NPS acknowledges that some natural localized wetlands, and their accompanying processes, would be lost by the road rehabilitation project. Impacts on the 0.9 acre of wetlands would be compensated for, on a minimum 2:1 acreage basis, by restoring riverine and palustrine wetland habitat in the Kantishna Hills region of the park (formerly a placer-mined stream and riparian habitat along Eldorado Creek). The NPS finds that this project is consistent with the Procedural Manual #77-1, Wetland Protection and with NPS DO #77-1, Wetland Protection, including the NPS no-net-loss of wetlands policy. The NPS finds that this project is in compliance with E.O. 11990, Protection of Wetlands.

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